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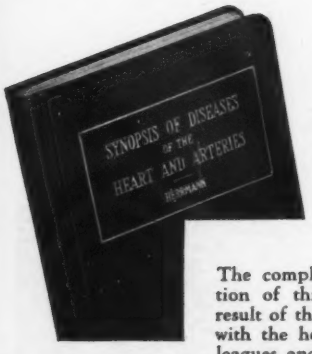

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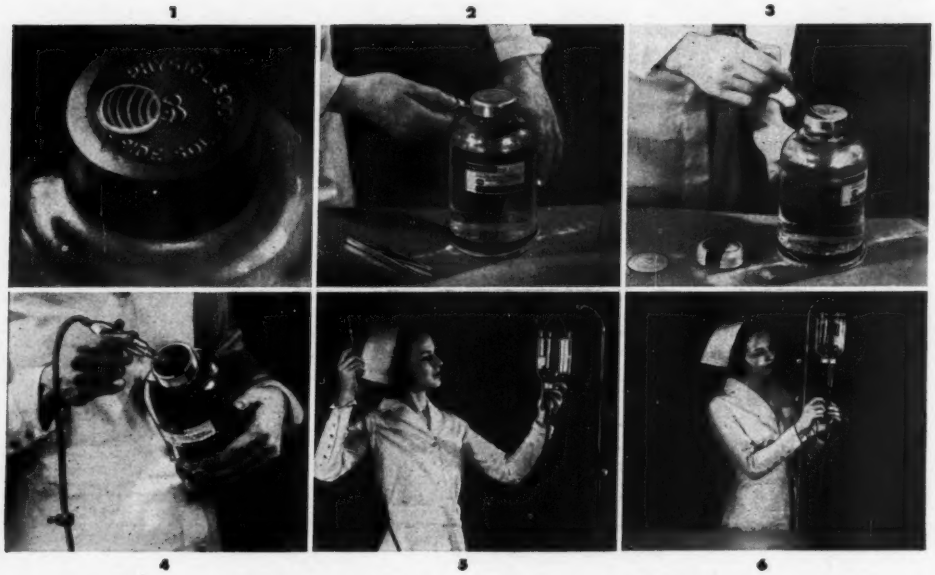

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1 Science, Mch. 14, 1941, p. 261.
2 Spies, Cooper, Clark & Blankenhorn, Jr. A.M.A., Feb. 26, 1938.
3 Jr. A.M.A., 104-16, 1377-1935.

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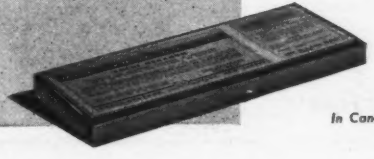

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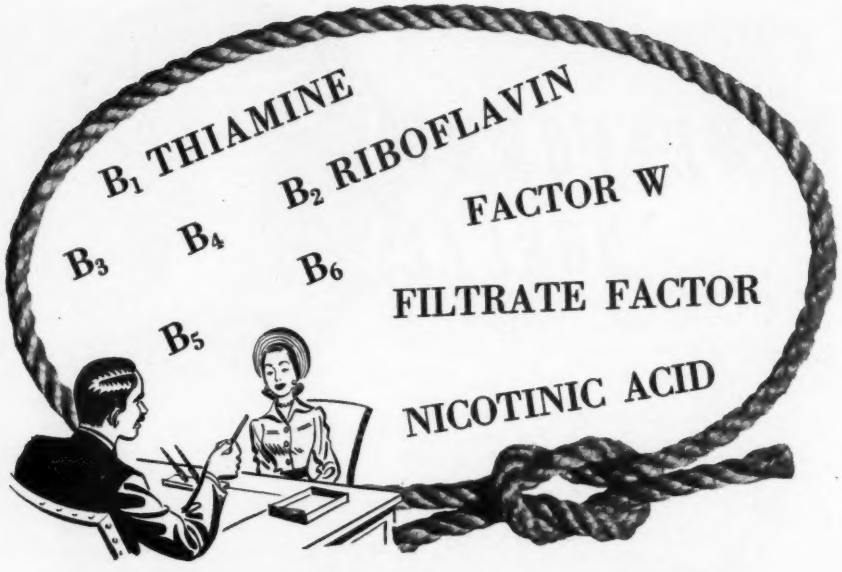

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(1) *Spies, T. D., Hightower, D. F., and Hubbard, L. H.: Jl. A. M. A., 115:292. July 27, 1940.*

(2) *Borsook, H., Dougherty, P., Gould, A. A., and Kremers, E. C.: Am. Jl. Digest, Dis. Vol. 5, June, 1938.*

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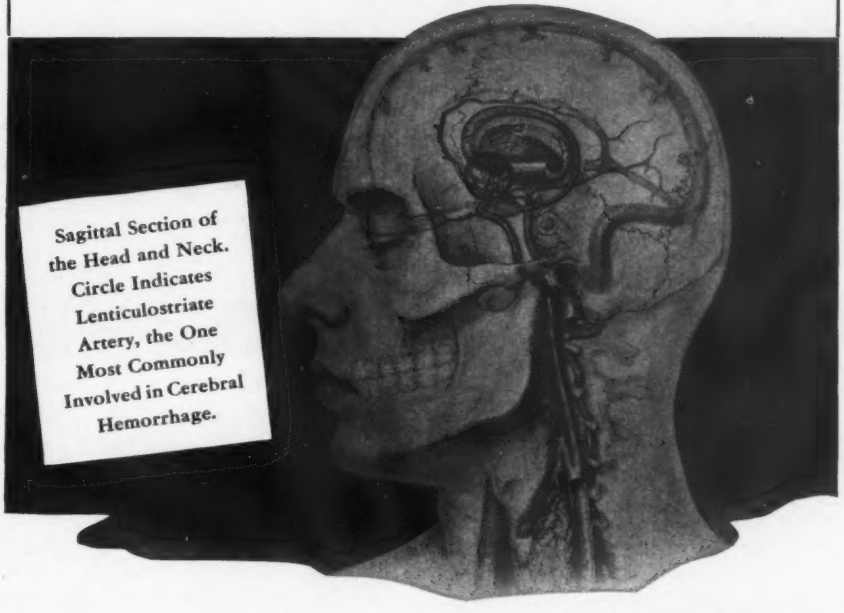

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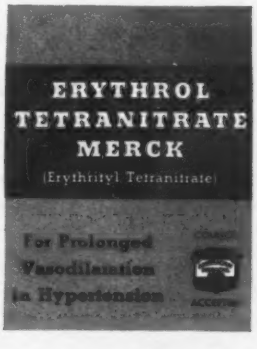

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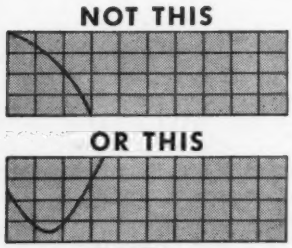

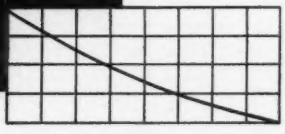

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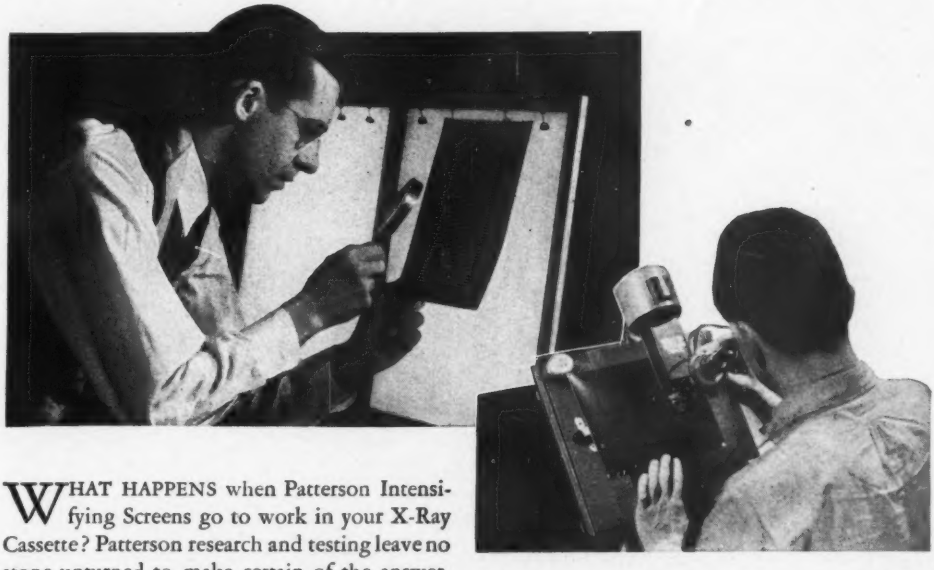
Spir. glyceryl nitratis	2-3 mins.	25 - 30	
Sodium nitrite	2-3 grs.	32	
Erythrityl tetranitrate	½-1 gr.	35	
Mannitol hexanitrate	1 gr.	35	
			Hours 1 2 3 4 5 6 7 8 9 10 11 12 13

(Based on results of the work of Matthew, as summarized by Sollmann, T.: Manual of Pharmacology, Philadelphia, W. B. Saunders Co., 1936, page 483.)

A NEVER-ENDING CHECK-UP

OF WHAT GOES ON INSIDE YOUR X-RAY CASSETTE



WHAT HAPPENS when Patterson Intensifying Screens go to work in your X-Ray Cassette? Patterson research and testing leave no stone unturned to make certain of the answer.

For example, the composition and purity of the chemicals in Patterson Screens are of utmost importance. Any deviation from the rigid standards will not only impair the efficiency, but might adversely affect the fluorescence and definition. Furthermore, any variation in the density of the chemicals in the screen will result in a varying density of the negative.

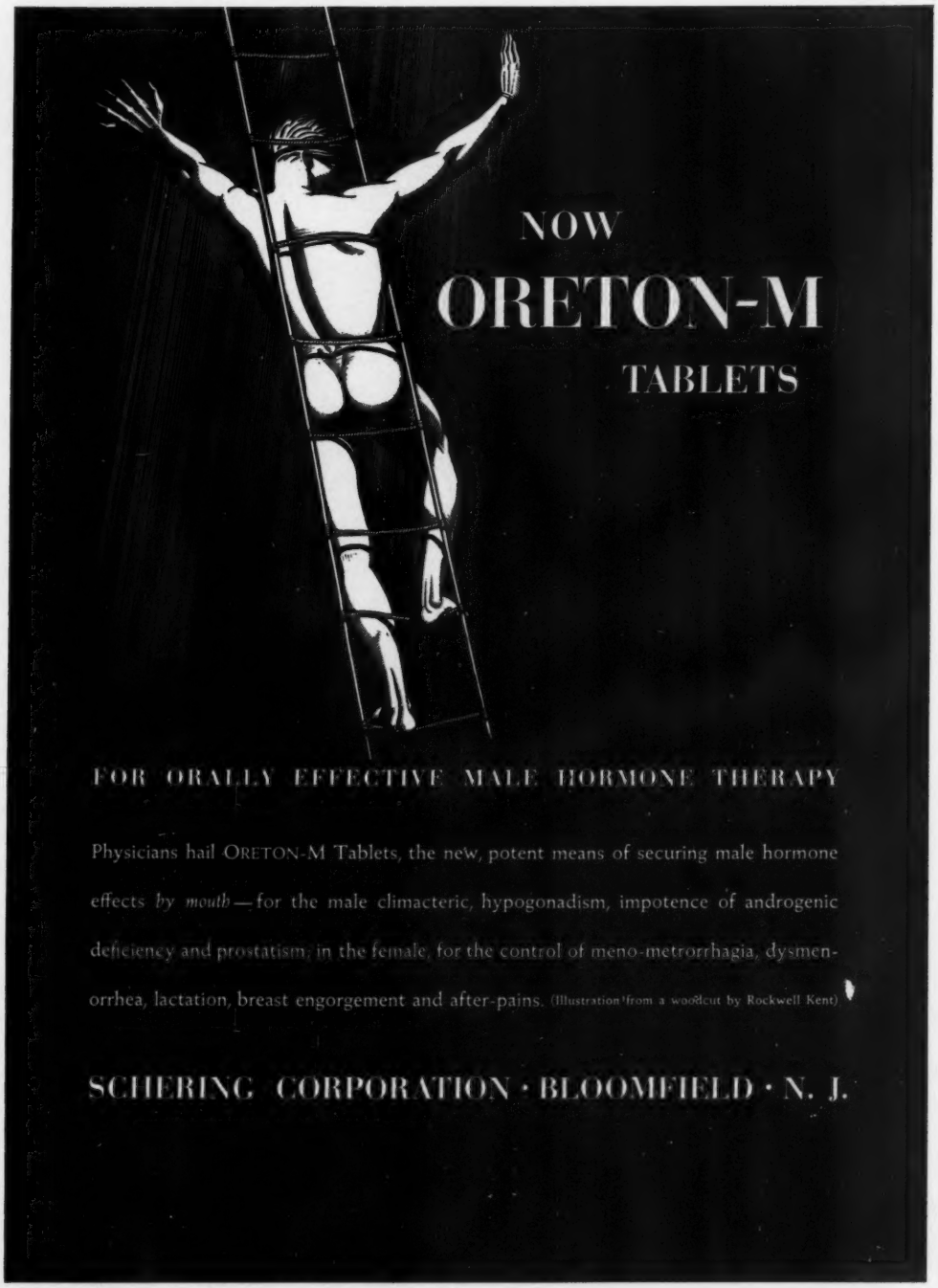
This is why at Patterson we are so careful to make certain, through the Densitometer test shown at right, that uniform, full scale densities are obtained from all areas of the screen as well as from each batch of screens produced.

Another important procedure is the test for detail—the exposure being made through a fine wire screen. In this way, images are obtained which enable us to gauge the performance of the screen and to eliminate any screen that does not match the standard. (This same test is recommended as a check to determine whether or not cassettes are maintaining perfect contact.) Other tests include a scientific analysis of the screens' range and contrast and a test for absence of harmful afterglow.

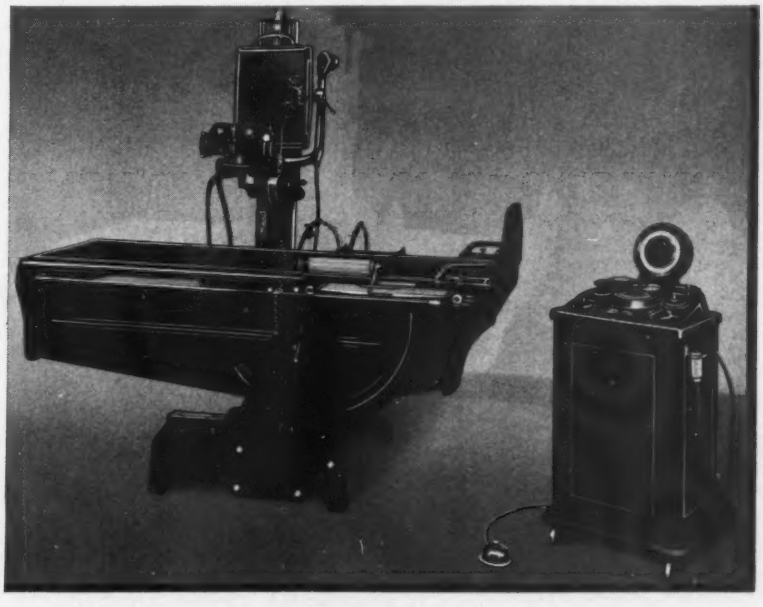
To some, this careful and continuous testing may seem like an extreme precaution—but it has been a vital factor in establishing and maintaining Patterson X-Ray Screens as the world's standard for quality.

THE PATTERSON SCREEN COMPANY
TOWANDA, PA., U. S. A.

Patterson · WORLD'S STANDARD FOR HIGHEST SCREEN QUALITY


NOW
ORETON-M
TABLETS
FOR ORALLY EFFECTIVE MALE HORMONE THERAPY
Physicians hail ORETON-M Tablets, the new, potent means of securing male hormone effects *by mouth*—for the male climacteric, hypogonadism, impotence of androgenic deficiency and prostatism; in the female, for the control of meno-metrorrhagia, dysmenorrhea, lactation, breast engorgement and after-pains. (Illustration from a woodcut by Rockwell Kent)
SCHERING CORPORATION · BLOOMFIELD · N. J.

THE UNIT THAT RAISED THE STANDARD OF 100-MILLIAMPERE RADIOGRAPHY



The General Electric X-Ray way of creating a new diagnostic x-ray unit is to make one to produce finer radiographs than are being obtained with existing equipment in the same range.

This ideal—established with the cooperation of the radiological profession—inspires the engineers who design new G-E apparatus. And this same ideal governs the jury charged with testing the unit radiographically as it advances from a crude hand-made model to the finished product by a process of changing and testing until the jury is completely satisfied.

The process is costly but unique and part of the secret of the success of units like the Model R-39 Combination X-Ray Unit—the unit that raised the standard of 100-milliampere radiography.

Convincing evidence of the new standard is the experience of 358 Model R-39 users. More convincing still would be a radiographic test of your own. To arrange this, simply clip, fill in, and mail the convenient coupon.

☐ I would like a copy of the R-39 catalog.

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GENERAL ELECTRIC X-RAY CORPORATION

2013 JACKSON BLVD. CHICAGO, ILL., U. S. A.

A28

Petrolagar*...

As a Bland Cleansing Enema

• The effect of a Petrolagar cleansing enema is to soften thoroughly the inspissated stool, and help establish a complete, comfortable bowel movement. Petrolagar serves this purpose well because it is miscible with water, a virtue that enables an even dissemination of minute oil globules throughout the residue in the colon.

The Petrolagar cleansing enema is preferable to irritating soap solutions in either the home or the hospital, because of its gentle, but thorough softening action.

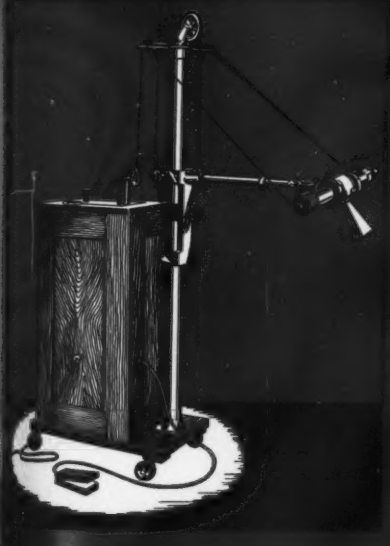
Consider the routine use of the Petrolagar cleansing enema in the hospital, postoperatively or in obstetrical cases, where normal bowel habits are temporarily disturbed.

How to use: Mix 3 ounces of Petrolagar Plain with water sufficient to make one pint to one quart, as desired, and administer by gravity. For retention enema administer at body temperature.

*Petrolagar—The trademark of Petrolagar Laboratories, Inc., brand emulsion of mineral oil . . . Liquid petrolatum 65 cc. emulsified with 0.4 gm. agar in a menstruum to make 100 cc.

Petrolagar Laboratories, Inc. • 8134 McCormick Boulevard • Chicago, Illinois

in 1916 Waite produced *the famous*



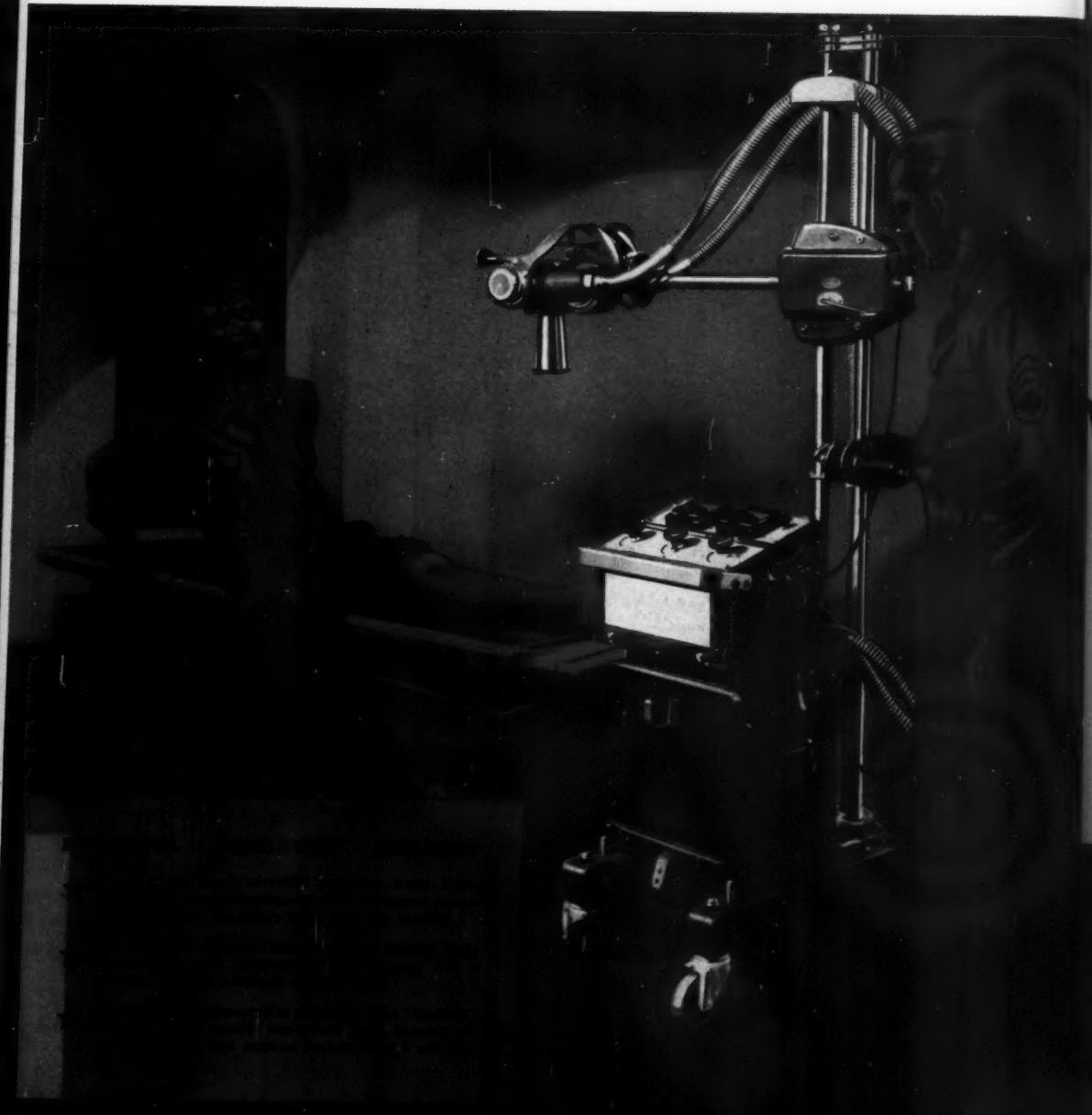
In 1916, prior to America's entry in the World War, the Army Medical Corps designed the original U. S. Army Portable X-Ray Unit. . . . For the first time in medical history, a compact, powerful, portable army unit facilitated radiographic work at the battle's front line. . . . These units were manufactured by Dr. Henry C. Waite, now President of the Waite Division of Picker X-Ray Corporation. . . .

Again in 1943, Picker-Waite engineers, working in conjunction with the U. S. Army Medical Corps, developed and produced the new shock-proof X-ray Field Unit. . . .

It is a significant fact that on two occasions and in less than a quarter of a century we have been privileged to serve our country in a national emergency. The entire Picker-Waite personnel pledges its cooperation and unceasing effort in the cause of national defense.

PICKER X-RAY CORPORATION

AMERICA *speeds her medical*



...defense with the **U. S. ARMY**

X-RAY FIELD UNIT

IN the vanguard of preparedness, with equipment "ready for action," stand the United States Army Medical Corps.

To anticipate any emergency now or in the future, the Army Medical Corps specified an X-ray Field Unit primarily designed for foreign body localization, yet with sufficient power and flexibility for every type of x-ray technic.

The problems involved in designing the high tension transformer, control, mobile base, tubestand, and a shockproof x-ray tube unit, to meet the rigid requirements of the Army Medical Corps, were successfully overcome by Picker-Waite engineers.

These Field Units are now in operation at Army Posts throughout the United States. . . . The executive personnel of the Army Medical Corps are to be congratulated for having made available to the United States Government a defense unit of such medical significance.

PICKER X-RAY CORPORATION

PICKER X-RAY CORPORATION

Executive Offices: 300 FOURTH AVENUE, NEW YORK, N. Y.

Factory: WAITE MANUFACTURING DIVISION, 17325 EUCLID AVENUE, CLEVELAND, O.

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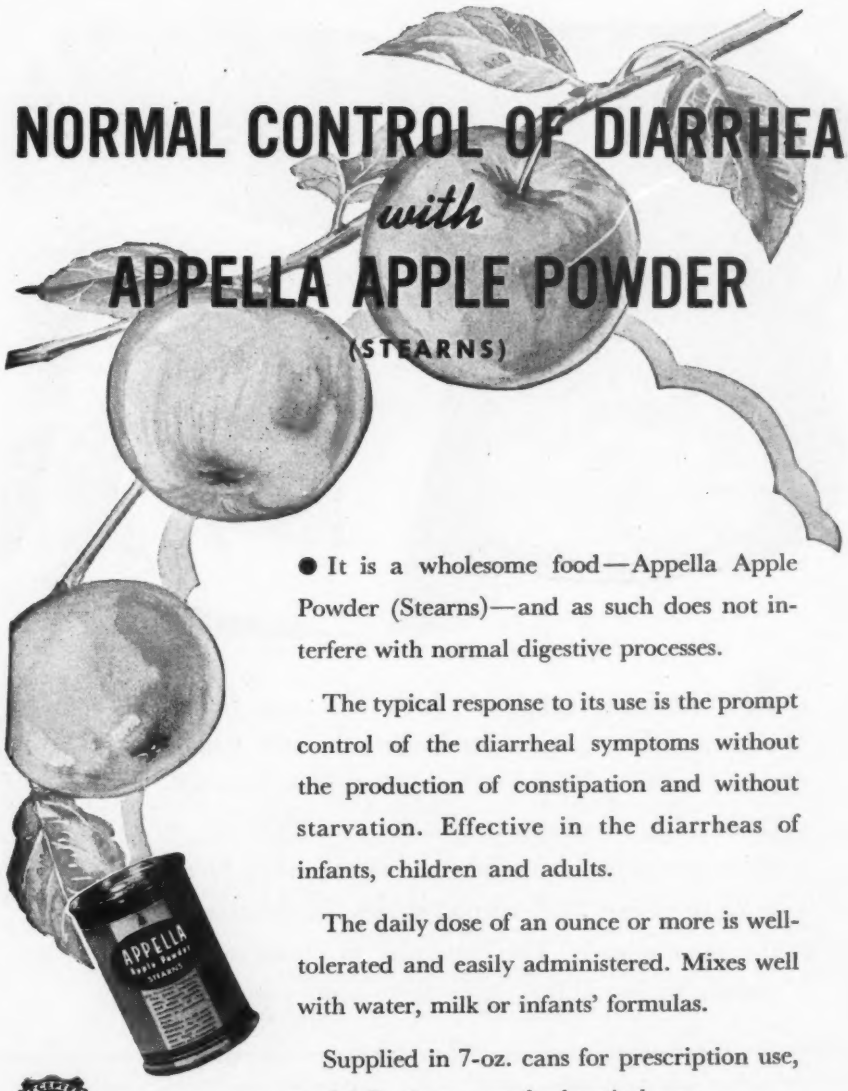
NORMAL CONTROL OF DIARRHEA *with* APPELLA APPLE POWDER

(STEARNS)



● It is a wholesome food—Appella Apple Powder (Stearns)—and as such does not interfere with normal digestive processes.

The typical response to its use is the prompt control of the diarrheal symptoms without the production of constipation and without starvation. Effective in the diarrheas of infants, children and adults.

The daily dose of an ounce or more is well-tolerated and easily administered. Mixes well with water, milk or infants' formulas.

Supplied in 7-oz. cans for prescription use, and 1-lb. 4-oz. cans for hospital use.

FREDERICK STEARNS & COMPANY, Detroit, Michigan

New York Kansas City San Francisco Windsor, Ontario Sydney, Australia

NO food (except breast milk) is more highly regarded than Similac for feeding the very young, small twins, prematures, or infants who have suffered a digestive upset. Similac is satisfactory in these special cases simply because it *resembles breast milk so closely*, and normal babies thrive on it for the same reason. This similarity to breast milk is definitely desirable—*from birth until weaning.*

A powdered, modified milk product especially prepared for infant feeding, made from tuberculin tested cow's milk (casein modified) from which part of the butter fat is removed and to which has been added lactose, vegetable oils and cod liver oil concentrate.

ACCEPTED AMERICAN MEDICAL ASSN. Council on Foods

One level measure of the Similac powder added to *two* ounces of water makes 2 fluid ounces of Similac. The caloric value of the mixture is approximately 20 calories per fluid ounce.

★ SIMILAC } SIMILAR TO BREAST MILK ★

M&R DIETETIC LABORATORIES, INC. • COLUMBUS, OHIO

THE RESEARCH BEHIND

FURMERANE

Going far beyond the "test-tube" stage, Furmerane has demonstrated its germicidal activity under rigid conditions identical with those encountered in clinical practice.

Furmerane is a powerful antiseptic in the presence of serum and exudates, on the skin, in open wounds and on mucous surfaces.

The safety factor—freedom from tissue irritation in effective concentrations—is one of the distinctive features of Furmerane in addition to its potent bactericidal and bacteriostatic properties.

FURMERANE
(2-Hydroxy-mercuri Furan)

Antiseptic for General Use

TINCTURE 1:400 SOLUTION 1:3000

Both forms are supplied in 4-oz., pints and gallons

Write for descriptive literature

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Ethical Pharmaceuticals Since 1888
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LOOSENING THE GRIP OF PAIN

CIBALGINE, "Ciba" is an analgesic of admirable effectiveness . . . a strategic combination of two proven drugs. Besides Dial, it contains aminopyrine, a pain reliever of long-standing reputation. Like every good therapeutically potent drug, it has its drawbacks and inherent dangers. Even though only an exceedingly low percentage of users have been reported adversely affected by aminopyrine, its administration should be under control of the physician.

CIBALGINE* exerts speedy analgesic action in neuralgias, myalgias, toothache, earache, headache; post-operatively; in postpartum pains; morphine withdrawal. Why not send for samples?

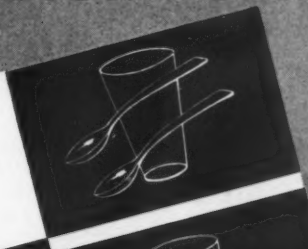
*Trade Mark Reg U S Pat Off Word "Cibalgine" identifies the product as a preparation of aminopyrine and diallylbarbituric acid of Ciba's manufacture.

TABLETS • ELIXIR • AMPULES

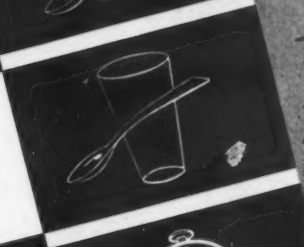
CIBA

CIBA PHARMACEUTICAL PRODUCTS, Inc., Summit, New Jersey

How to control Diarrhea with Wyeth's KAOMAGMA



At the onset...
administer two tablespoonfuls of Kaomagma Plain, in a little water



and...
follow this with one tablespoonful of Kaomagma Plain, after every bowel movement . . .

then...
when stools become consolidated, one tablespoonful of Kaomagma with Mineral Oil 3 times daily may be indicated.

KAOMAGMA • Coats and protects the irritated mucosa, acting as a mild astringent. • Precipitates and coagulates bacterial suspensions. • Adsorbs and renders innocuous toxic and irritant substances in the intestines.

Kaomagma Plain and Kaomagma with Mineral Oil are supplied in 12-oz. bottles.

John Wyeth and Brother, Incorporated, PHILADELPHIA

Diarrhea in Infancy

Take It In Time

Just a day or two of light nourishment prepared from Mellin's Food as suggested below will usually avert an intestinal disturbance that might develop into a serious diarrhea if not taken in hand at the first appearance of loose stools.

Mellin's Food*. . . 4 level tablespoonfuls

Water (boiled, then cooled) . . . 16 ounces

Give one to three ounces every hour or two until the stools lessen in number and improve in character.

The mixture may then be strengthened by the gradual substitution of boiled skimmed milk for water until the quantity of skimmed milk is equal to the normal quantity of milk used in the baby's formula. Finally the fat of the milk may be gradually replaced by skimming less and less cream from the milk.

Samples sent to physicians upon request.

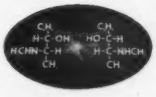
Directions for using Mellin's Food are left entirely to the physician.

Mellin's Food Company, Boston, Mass.

**MELLIN'S FOOD: Produced by an infusion of Wheat Flour, Wheat Bran and Malted Barley admixed with Potassium Bicarbonate — consisting essentially of Maltose, Dextrins, Proteins and Mineral Salts.*

RACĔPHEDRINE

in the Hay Fever Season



On local application to the nasal mucous membrane, Solution Racĕphedrine Hydrochloride (Upjohn) diminishes hyperemia and reduces swelling, thus bringing comforting relief to the hay fever patient.

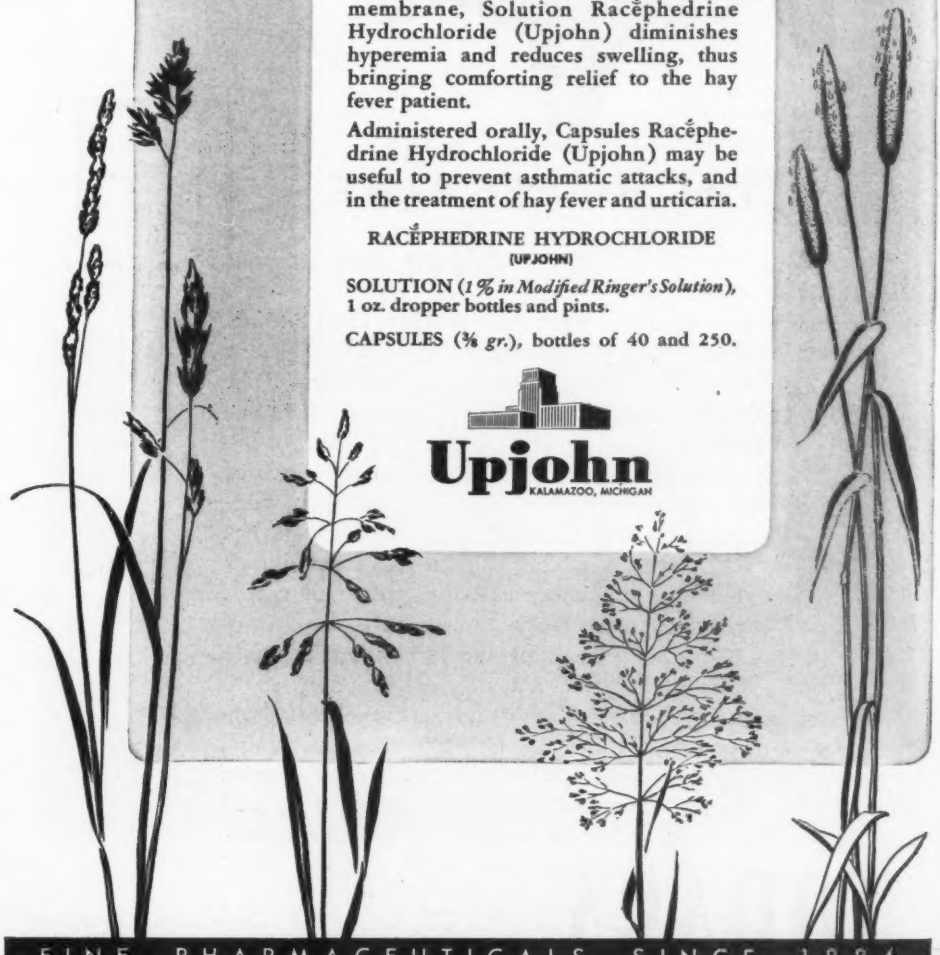
Administered orally, Capsules Racĕphedrine Hydrochloride (Upjohn) may be useful to prevent asthmatic attacks, and in the treatment of hay fever and urticaria.

RACĔPHEDRINE HYDROCHLORIDE
(UPJOHN)

SOLUTION (*1 % in Modified Ringer's Solution*), 1 oz. dropper bottles and pints.

CAPSULES (¾ *gr.*), bottles of 40 and 250.

Upjohn
KALAMAZOO, MICHIGAN



FINE PHARMACEUTICALS SINCE 1886

THE NICKEL BANK *Goes on a* DIET

The old nickel bank finds itself on short rations. No longer is it necessary for the anxious parent to combine thrift with bribery when the child requires an aid in relieving the costiveness frequently occurring in children.

Loraga has succeeded in meeting the needs of the situation. A plain mineral oil emulsion, without any added laxative ingredients, Loraga has achieved a palatability and freedom from oiliness that even the most exacting taste will accept without remonstration.

For children and for adults who need the gentle aid to evacuation that a fine, plain mineral oil emulsion offers, Loraga makes available a preparation that has earned favorable professional recognition because of therapeutic merit. A note on your letterhead will bring you a liberal trial quantity of Loraga. Available in 16-ounce bottles.

LORAGA

WILLIAM R. WARNER & CO., INC.
113 West 18th Street New York City

THE TUCKER SANATORIUM, INC.

212 West Franklin St. (Corner of Madison)

RICHMOND, VIRGINIA

This is a private Sanatorium for the Neurological Practice of Drs. Beverley R. Tucker, Howard R. Masters and James Asa Shield.

The Tucker Sanatorium is for the treatment of nervous and endocrine diseases. There are departments of massage, medicinal exercises, hydrotherapy and physiotherapy. The Sanatorium is large and bright, surrounded by a lawn and shady walks, large verandas and has a roof garden. It is situated in the best part of Richmond and is thoroughly and modernly equipped. The nurses are specially trained in the care of nervous cases.

St. Elizabeth's Hospital
Richmond, Virginia

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The operating rooms and all of the front bedrooms are completely air-conditioned.

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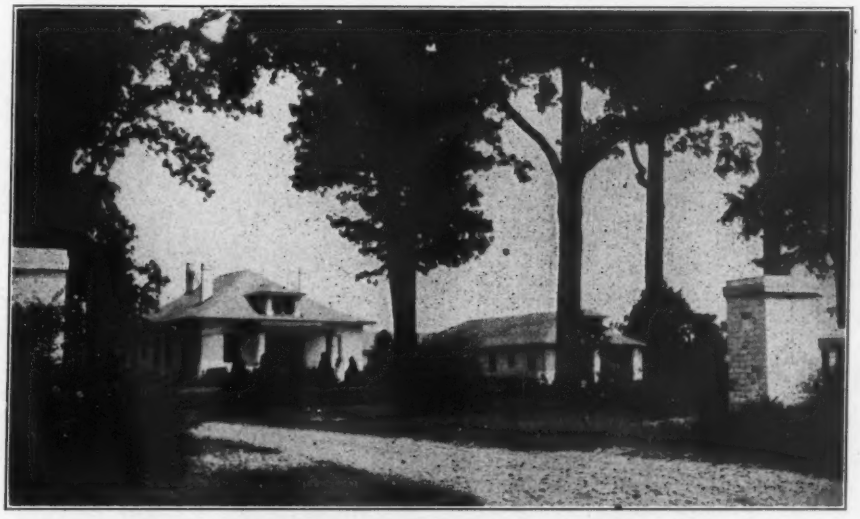
The School of Nursing is affiliated with Johns Hopkins Hospital School of Nursing in Baltimore for a three months' course each in Pediatrics and Obstetrics.

Address: Director of Nursing Education



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For the Diagnosis and Treatment of Mental and Nervous Disorders

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SAN ANTONIO, TEXAS

JAMES L. ANDERSON, M.D., Medical Director

Admits patients irrespective of denomination or creed.

Ideal all year climate.—Excellent medical and nursing care.—Radiographic, Fluoroscopic and Pneumothorax service.

New, distinctive, Individual **Bungalows,** highly modern, and **Private Rooms** with baths and sleeping porches, all equipped with radio.—Beautiful grounds.

Moderate rates.

For booklet and information address:

PAUL F. HEIN, D.D.
Pastor and Superintendent

For Patients With Alcoholic Problems

--*The Farm*

A non-institutional arrangement in Howard County, Maryland, for the individual psychological rehabilitation of a limited number of selected voluntary patients with ALCOHOL problems — both male and female — under the psychiatric direction of

Robert V. Seliger, M.D.

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Saint Albans Sanatorium

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A modern, ethical institution, fully equipped for the diagnosis, care and treatment of nervous and mental diseases and selected addiction cases. 2,000 feet elevation. Rates reasonable. Occupational and Hydrotherapy Departments.

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Established 1890 MILLEDGEVILLE, GA.
For the treatment of
NERVOUS AND MENTAL DISEASES
Grounds 600 Acres — Buildings Brick, Fireproof — Comfortable — Convenient — Site High and Healthful
E. W. ALLEN, M.D., Department for Men
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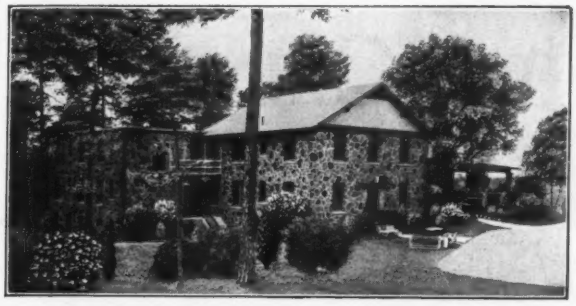
Terms Reasonable



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"In the Mountains of Meridian"

MERIDIAN, MISS.

Diagnosis and Treatment of Nervous and Mental Diseases, Alcoholic and Drug Addictions. Especially equipped for the Treatment of Mental Disorders. Convalescents. Elderly People and those requiring METRAZOL THERAPY given special monthly rates. Personal supervision of patients. Consulting physicians.

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Formerly sixteen years Superintendent of East Mississippi State Hospital

Dr. Brawner's Sanitarium

SMYRNA, GEORGIA

(Suburb of Atlanta)

● *For Nervous and Mental Disorders Drug and Alcohol Addictions*

Approved diagnostic and therapeutic methods. Hydrotherapy, Electrotherapy, Massage, X-Ray and Laboratory.

Special Department for General Invalids and Senile Cases at Monthly Rates.

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Asheville, North Carolina

An Institution
FOR
Rest,
Convalescence,
the diagnosis and treatment of
NERVOUS
AND
MENTAL DISORDERS, ALCOHOL
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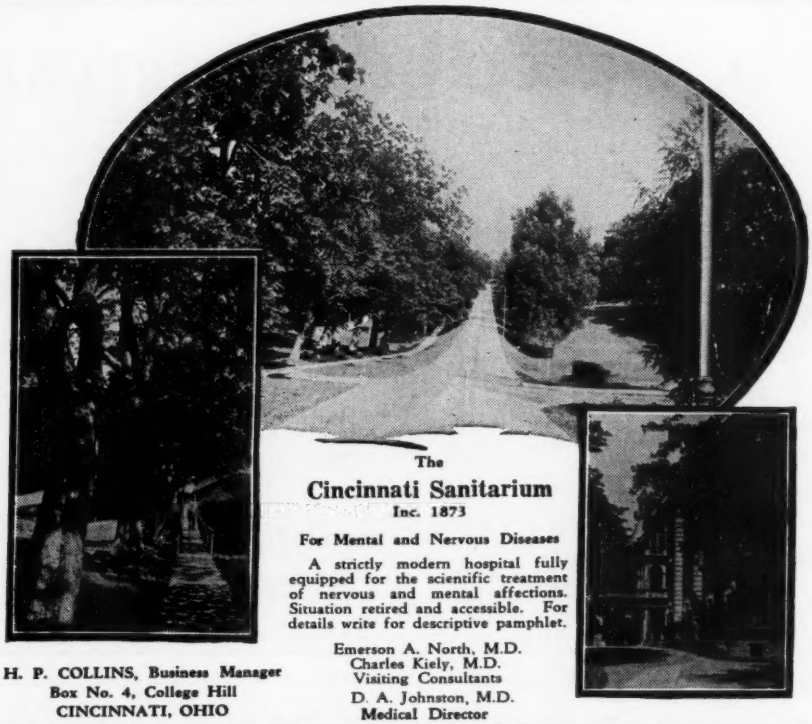

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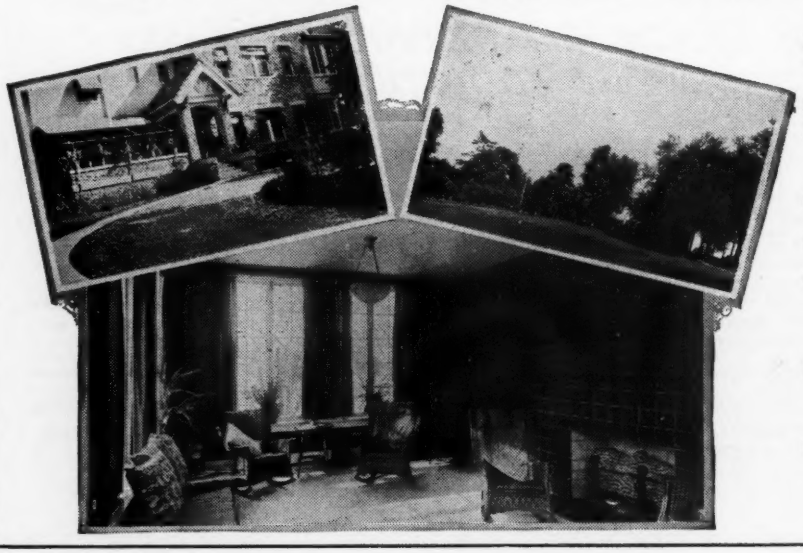

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THE MANAGEMENT OF OLD CONTRACTURES OF THE UPPER EXTREMITY RESULTING FROM THIRD DEGREE BURNS*

By RANDOLPH JONES, JR., M.D.
Durham, North Carolina

In a previous article the principles governing the management of contractures of the palm and digits resulting from third degree burns were discussed.[1,2] This presentation will review the methods used in treating these deformities and will also include a resume of the procedures to be followed in the treatment of contractures of the antecubital fossa and axilla. Davis,[7,8] Blair,[2,3] Brown,[3,4] and others,[1-6] have enumerated the principles underlying the correction of these problems and have obtained excellent results in their treatment.

The contractures of the hand fall into three general groups. Of these, the simplest consists of a web or bridle crossing a flexion crease, forming a scar which is unattached to the palmar fascia and deeper structures (*Fig. 1*). This type of deformity may be corrected by the interposition of skin flaps formed by incisions made at an angle to an incision along the prominent edge of and splitting the web. At times it may be necessary to supplement this procedure with one or more small full thickness grafts. This is usually the case when the web is broad, as after excision of the dense scar composing its edges, the flaps subsequently raised are insufficient to cover the denuded subcutaneous tissue and still allow extension of the digit (*Fig. 2*).

A contracture of the second type commonly encountered is a broad scar which involves much of the palmar or dorsal surface of the hand and at times extends out on the fingers (*Fig. 3*). Although this cicatrix, if palmar, usually is attached to the palmar fascia, it is not adherent to the deeper structures and the action of the intrinsic muscles and of the flexor and extensor tendons is limited by the superficial scar rather than by adhesions to these tissues. Such a contracture even though caused originally by a burn which did not destroy the deep structures may cause a marked deformity when allowed to go uncorrected for a long period of time (*Fig. 4*). Muscles and tendons may become contracted or stretched beyond the point of function. Varying degrees of muscular atrophy and fibrosis may occur. Joint capsules may become stretched or markedly contracted and subluxations may develop with distortion of the articulating bone surfaces. When this stage is reached even the most patient and persistent attempts to restore the full usefulness of the member are unsuccessful.

When a deformity of this kind is treated before marked change has taken place in the deep structures of the hand an excellent functional and a satisfactory cosmetic result may be obtained (*Fig. 5*). Broad palmar scars may be excised together with the underlying palmar fascia, when it is involved, leaving a layer of fat and areolar tissue covering the digital nerves and vessels, the lumbrical muscles, and the flexor tendons. After careful complete excision of the scar, gentle extension of the fingers often allows immediate full release of the contracture. A full thickness graft may be used to cover the denuded area and adequate immobilization may be provided by splinting the fingers, hand and wrist in extension (*Figs. 6* and *7*). When heal-

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*Read in Section on Railway Surgery, Southern Medical Association, Thirty-Fourth Annual Meeting, Louisville, Kentucky, November 12-15, 1940.

*From the Department of Surgery, Duke University School of Medicine, Durham, North Carolina.

ing is complete a splint providing spring or elastic traction may be worn at night for six months to maintain and increase the extension obtained at operation.[13 15]

The third type of contracture is due to a scar which involves not only the skin and palmar fascia, but which is also attached to the deep structures of the hand. The estimation of the depth of the scar in these cases is difficult and frequently, at operation, one finds the cicatrix more extensive than was thought to be the case when the patient was examined. The digital nerves may be difficult to identify in the scar; the lumbrical muscles may be atrophic or replaced by cicatrix; the flexor tendons may be destroyed or buried in a dense mass of scar tissue, which is adherent to the bones and joints and the interosseous membrane. Not infrequently in these cases there has been a partial or total loss of one or more digits. Owing to

Fig. 1

History 71311, a white boy, 8 years of age. (A) Bridle or web contracture of the palmar aspect of the fifth finger of 18 months' duration. This was released by the interposition of Z flaps and the transplantation of a small full thickness graft. (B) Result 6 months' after operation.

Fig. 2

History A 13177, a white boy, 3 years of age. (A) Broad web contracture of the palmar surfaces of the thumb and index finger with a dense scar binding the thumb to the palm. The patient received the third degree burn two years before. The palmar cicatrix which involved the thumb was excised and the defect covered with a full thickness graft. The deformity of the index finger was corrected by the interposition of Z flaps. (B) Result 4½ months after operation.

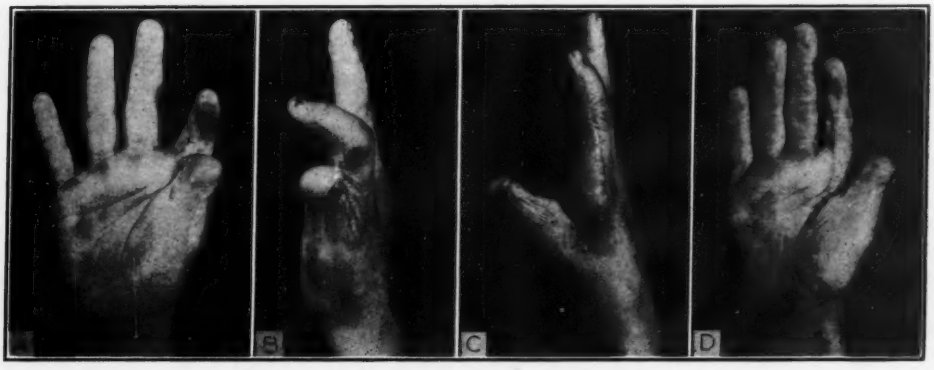

Fig. 3

History A 6302, a white boy, 12 years of age. (A B) Broad adhesion between the deformed thumb and the index finger with a palmar contracture of the index finger of 11 years' duration. The deformity was corrected by separating the fingers and by covering the thumb with pedicle flaps raised from adjacent dorsal and palmar surfaces. The denuded area on the index finger was covered with a full thickness graft. (C D) Result 6 months after operation.

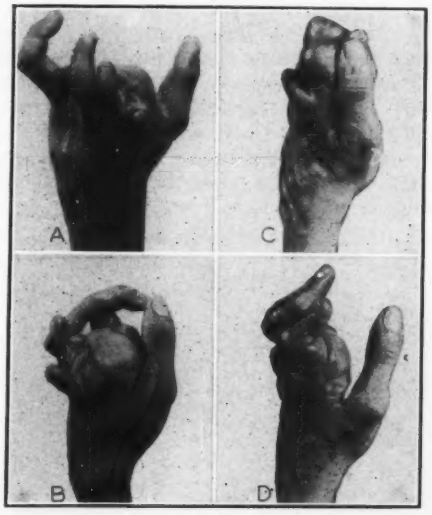

Fig. 4

History 68372, a white man, 18 years of age. (A B) Broad contracture of the dorsum of the left hand resulting from a third degree burn 17 years previously. The presence of this deformity during the growth period of the patient produced irremediable changes in the joints and tendons of the hand. (C D) Only partial restoration of function was possible after numerous procedures which included full thickness grafting, transplantation of a tube flap to the dorsum of the hand, and tendon lengthening operations, in addition to the prolonged use of corrective splints. The original burn in this case was no deeper than that shown in *Fig. 5* and an equally satisfactory result could have followed early grafting.

the deep tissue loss and adhesions which are present these are often hopeless problems from the standpoint of restoration of function and only a few general rules may be formulated regarding their treatment.

Before attempting any surgical procedure to correct the deformity every effort should be made to obtain the maximum function of the disabled member by elastic (traction), massage, exercise, and traction. Improvement following the use of these measures may assure some degree of success by operation.

Since for these patients it is necessary to provide a fat pad to cover the deep structures, as well as skin to replace that lost, arrangements may be made to transplant a pedicle or tube flap at operation (*Figs. 8* and *9*). The scar may be excised as widely as possible and adherent tendons and muscles freed as fully as the operative site allows. Manipulation at this point may demonstrate the need of tendon lengthening or capsulotomy. These procedures may be performed in order to obtain maximum relaxation of the contractures. Tendon transplantation, when indicated, should be deferred until the transplanted flap has become viable in its new location and postoperative physiotherapy has had its full effect. Later, secondary operations

Fig. 5

History 92578, a white man, 35 years of age. (A B) Third degree burn of the dorsum of the hand due to contact with boiling grease. (C) Result 18 months after application of a "splint thickness" graft to the denuded area. Fresh burns of the palm and dorsum of the hand should be covered with this type of skin graft as soon as the raw surface can be prepared for the reception of the graft.

such as those mentioned above may release other contractures and still further increase function.

The classification suggested for the deformities of the hand may be applied to similar scars crossing the wrist, the elbow, and the axilla. A bridle or web extending from the chest wall to the wrist may be superficial and involve only the skin. After the interposition of angle or Z flaps raised along the entire length of the web the accordion-pleated scar which results disperses the direct pull of the former web and prevents its recurrence[11 14] (*Figs. 10* and *11*). Should these flaps be insufficient to cover the raw surface when the arm is extended, intermediate or "split thickness" grafts may be used for these defects (*Figs. 12* and *13*). The skin provided by this graft is well adapted to bear the friction and wear encountered in these regions and there is little late contracture of the graft when it is placed on tissue which is not scarred.

A broad cicatrix involving only the skin and subcutaneous tissue of the antecubital fossa and

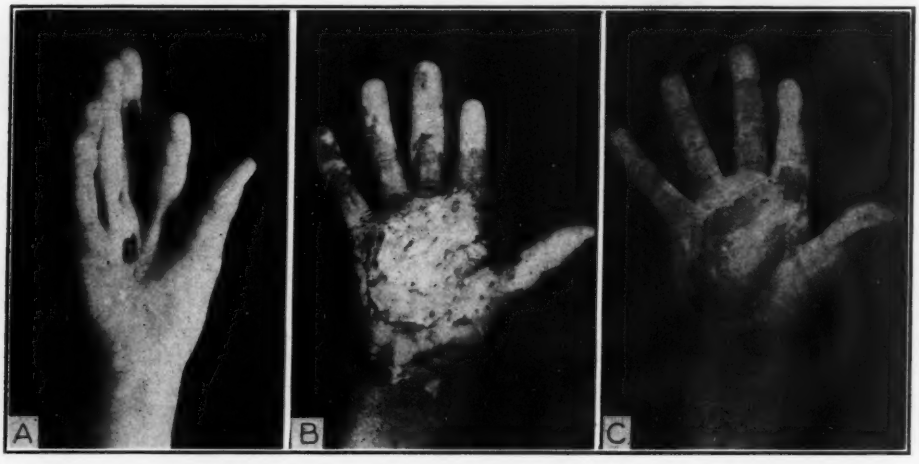

Fig. 6

History W 19885, a white boy, 12 years of age. (A) Broad contracture of the palm of 9 years' duration. (B) Appearance of the hand at the time the first dressing was removed after excision of the palmar cicatrix and transplantation of a full thickness graft. (C) Full thickness graft 6 months after operation.

Fig. 7

History A 40030, a white boy, 6 years of age. (A) Palmar contractures of 5½ years' duration. This common type of deformity often results from a burn received by an infant from a fall in an open fire or against a hot stove. The scars were excised, allowing the fingers to be fully extended and full thickness grafts were placed in the defects. (B) Result 5 months after operation. Extension splints are worn at night for 6 to 12 months after the patient leaves the hospital.

axilla may be excised and split thickness grafts placed on the tissue laid bare when the arm is extended. Blair, Brown and Hamm[3] have advocated this method of treatment for axillary and brachial scars. Burton[5] also has demonstrated the usefulness of this type of graft after division and relaxation (rather than excision) of the scar causing the contractures (*Fig. 14*). The intermediate graft has largely superseded the Thiersch and the Wolfe-Krause grafts in axillary reconstruction, although Davis and others have noted that the latter grafts have been used successfully in this situation.

We have seen but few contractures of the axilla so deep and extensive that it was necessary to transplant a pedicle or tube flap to protect the axillary contents. That such a situation is encountered frequently is attested to by the numerous references to the usefulness of this procedure. Davis,[7] Garlock,[9 10] Sparrow[17] and others

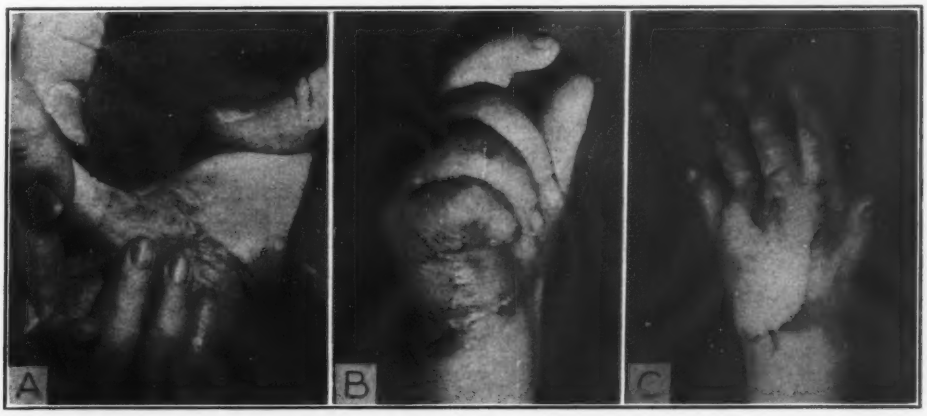

Fig. 8

History 80396, a white girl, 16 months of age. (A B) Extensive contracture of the fingers and the palm resulting from a third degree burn 6 months previously. (C) Result 1 month after excision of the cicatrix and reconstruction of the palm by means of a tube flap. Deep scars in this case made the use of a pedicle or tube flap mandatory.

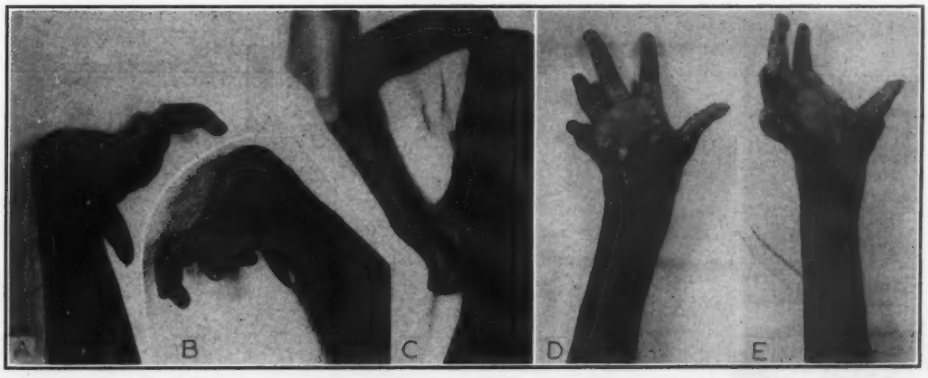

Fig. 9

History 57962, a colored girl, 7 years of age. (A B) Broad deep cicatrix of the palmar surface of the right hand and the wrist of 5 years' duration. The contractures of the fourth and fifth fingers are also evident. (C) Since this scar extended down to the flexor tendons, it was necessary to cover the defect, which remained after excision of the cicatrix, with a pedicle flap. (D E) Result 2 months after operation.

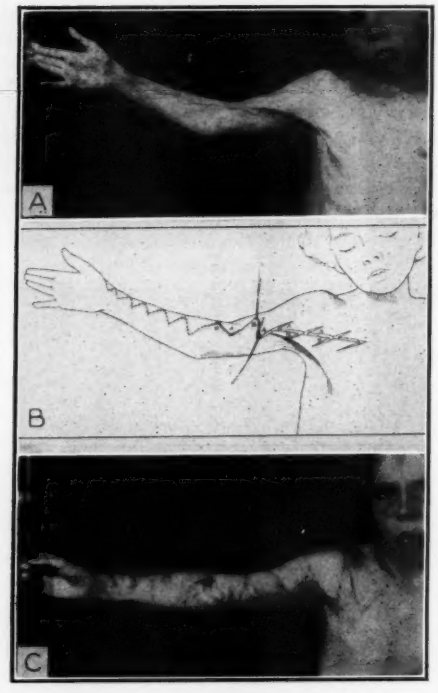

Fig 10

History 23919, a white girl, 9 years of age. (A) Web contracture or bridle, extending from the base of the thumb to the chest wall, crossing the antecubital fossa and axilla. This child received the third degree burn 4 years previously. (B) The deformity was corrected by the interposition of Z flaps. The resulting accordion-pleated scar disperses the linear "pull" of the bridle. (C) Results 5 months after operation.

have reported instances in which this method was used and in one of our cases removal of the axillary cicatrix necessitated the shifting of a pedicle flap to protect the nerves and vessels of the upper arm exposed when the arm was abducted (*Fig. 15*). A partial division of the pectoralis major was necessary in this case. This procedure has been used by others and instances have been reported in which it was necessary to transplant the origin of the pectoralis major on the chest wall to relieve the contracture.

DISCUSSION

Although it seems worth while to classify the contractures of the upper extremity in the three main groups described, in order to emphasize the three principal methods used in their correction, we do not imply that these are simple conditions and that only one procedure is applicable to a given case. The surgeon should be prepared to replace his originally planned procedure by another during operation if the scar proves deeper than anticipated. It may be necessary to place the hand beneath an abdominal pedicle flap when originally a full thickness graft was considered adequate.[16] [18] Each patient presents an individual problem and it may be advisable to use a combination of plastics on peripheral webs while the central scar is replaced by a free graft, or a pedicle, or tube flap. In other cases, if an unsatisfactory result follows the transplantation of a free graft, this may be corrected by the use of a pedicle or tube flap. Davis[7] has noted that often more than one operation is necessary to correct these deformities and that the

Fig. 11

History A 47607, a white girl, 6 years of age. (A) Web contracture of 5 years' duration similar to that shown in *Fig. 10*. (A) This was treated by the interposition of Z flaps. (B) Result 3 months after operation.

ultimate result should not be recorded until a year has elapsed after the final operation.

In considering what can be hoped for in restoration of function it is well to remember that young tissue has much greater reparative power than mature or aged tissue (*Fig. 16*). Although we have not had the opportunity to observe the growth of skin transplanted as an intermediate graft over a period of years, we have found transplanted full thickness grafts, and pedicle or tube flaps keep pace in growth with surrounding structures. During the growth period of children, there is a greater tendency for muscle, tendon and joint function to return to normal than is the case with adults. It seems superfluous to state that, all other things being equal, the sooner a contracture is corrected, the better the functional result obtained. Much can be

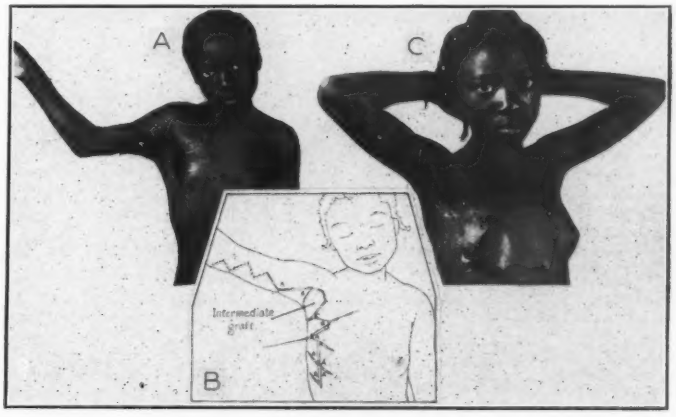

Fig. 12

History A 22178, a colored girl, 9 years of age. Web contracture of axilla of 7 years' duration. (B) Although the bridle was released by the interposition of Z flaps, these were insufficient to cover all raw surfaces when the arm was abducted, and it was necessary to transplant an intermediate graft to cover the axilla. (C) Result 8 months after operation.

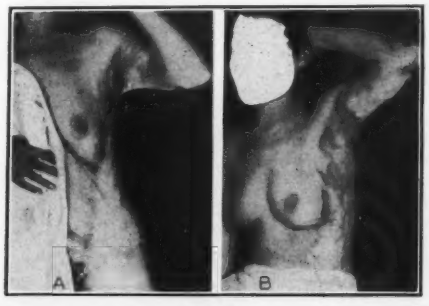

Fig. 13

History 32008, a white girl, 18 years of age. (A) Contracture of left axilla of 12 years' duration released by appropriately placed Z incisions supplemented by a full thickness graft. Five operations over a period of two years were necessary to release all lines of tension. (B) Result 3 months after the final operation.*

*Case of Dr. Harold Finkelstein.

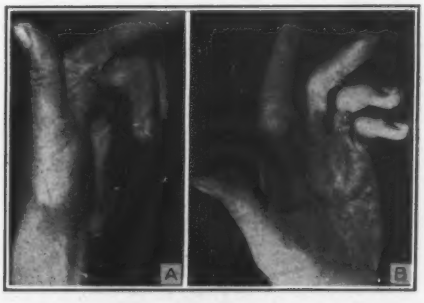

Fig. 16

History A 14175, a white man, 37 years of age. (A) Contracture of the left palm of 21 months' duration resulting from a third degree electrical burn. (B) Result 9 months after operation. The results following the release of contractures in adults are not always as satisfactory as those obtained in children. In this instance the deep scarring and contractures in the joint capsules have prevented complete restitution of function. Prolonged physiotherapy and an elastic traction splint worn at night may bring about a better result a year hence.

done to reduce the extent of these deformities by covering the burn surfaces at the earliest possible time with split thickness grafts.

Complicating systemic disease, particularly arthritis, may greatly diminish the patient's ultimate functional efficiency. The tendency to form keloids also may interfere with full return of function. At the present time, our method

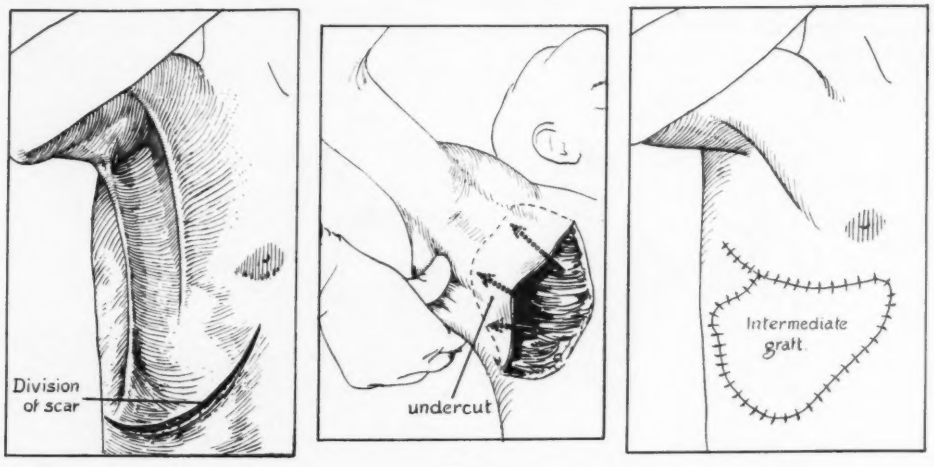

Fig. 14

Burton's[5] method of releasing an axillary contracture similar to that shown in *Fig. 13.* (A) The scar tissue is divided transversely and after undercutting the margins of the incision sufficiently widely to secure the desired relaxation, the defect created is covered with an intermediate graft.

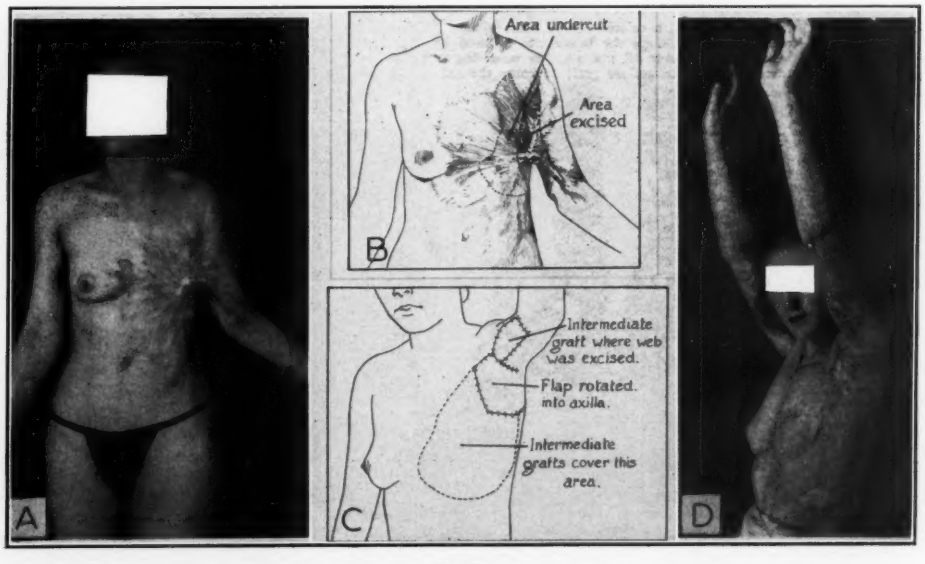

Fig. 15

History A 13460, a white woman, 19 years of age. (A) Contracture of the left axilla of 15 years' duration resulting from a third degree burn. Six years ago an attempt was made elsewhere to release this brachiothoracic adhesion by dividing the scar tissue, but without success. (B C) The deformity was corrected at one operation by utilizing the procedure shown in these sketches. (D) Result 10 months after operation.

of minimizing this complication lies in the use of pedicle or tube flaps rather than free grafts in the case of these patients. Should keloids subsequently form along the margins of the transplanted skin, they may be treated by excision and radiation.

SUMMARY

A classification of contractures of the upper extremity is suggested based on the extent and depth of the scar tissue present. Methods of correcting these deformities are discussed and cases illustrating the procedures now commonly used are presented.

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DISCUSSION (*Abstract*)

Dr. Milton Adams, Memphis, Tenn.—By early grafting of such injuries, practically all scar tissue contractures can be prevented. It is much better completely to remove all of the scar tissue and cover over the resulting raw area with a skin graft than to try to release the contracture by a rearrangement of the scar tissue by Z flaps.

A large wound healed with even the best scar tissue is never so stable as one which has been skin grafted. It is seldom necessary to use a pedicle flap in the palm of the hand. Practically all of these can be corrected with a thick split graft. In a few cases a Wolfe graft may be used. On the back of the hand an intermediate graft is all that is ever necessary, although the tendon sheath may be exposed.

If one is not particularly adept at using the skin graft knife, one might use the Padget dermatome, as it is much better if these split grafts are of uniform thickness. In any grafted case it is of utmost importance that the parts be kept extended until the contractural period has passed, which is a minimum of two months, most often three to four months.

Dr. Neal Owens, New Orleans, La.—Few surgeons realize, unless cases of this type are encountered, just how many potential complications can arise, and just how difficult it is to avoid many of the complications which give unsatisfactory results.

I think one of the most important considerations in the treatment of injuries to the hand from burns is that of debridement, as Dr. Adams has pointed out. We are, I believe, frequently misled in our selection of treatment by assuming that a burn is a specific type of injury which does not require the same treatment as would be given an ordinary wound. The sooner we accept burns as wounds and treat them as such, the sooner many of these distressing complications will be avoided. Of course, this, too, is overshadowed by many of the reports that get into the literature where the degree of burn is not fully realized. One in reading some of these frequently assumes that a given method offered is a panacea for the treatment of all burns, since the results imply that a third degree burn has been treated instead of the first and second degree burn which represented the true diagnosis.

If first or second degree burns are properly debrided, healing usually occurs by primary intention, whereas in the third degree burn, following an adequate debridement, the defect should be receptive for grafting at about fifteen to eighteen days. This, of course, implies that healing in the third degree burn frequently requires grafting and also an additional two to three weeks in hospitalization time.

I should like, also, to re-emphasize the point that Dr. Adams brought out about the use of the pedicle. There are few instances where a pedicle is indicated in the correction of a defect of the hand. When they are used, the result is consistently not good cosmetically. Frequently, the hand has the appearance of a bear's paw, or something equally unsightly, and the function is not so satisfactory as where a half thickness graft has been used. Of course, where there is destruction of all tissue down to bone, one must use a pedicle bearing a certain amount of fat.

We should not assume that the presence of a keloid means permanent keloid response because burns produce thick scars in healing, particularly where considerable infection has been present. The fact that a keloid follows healing of a burn does not mean that the patient has a keloid tendency. Frequently where this is encountered one finds that other wounds have been present which have healed without keloid formation.

TROCHANTERIC OSTEOTOMY FOR UNUNITED FRACTURES OF THE NECK OF THE FEMUR*

By J. S. SPEED, M.D.
and
HUGH SMITH, M.D.
Memphis, Tennessee

The enthusiastic reception of internal fixation for fresh fractures of the neck of the femur has temporarily relegated the problem of ununited fractures of this region to the background. Distinct advances have been made in the treatment of ununited fractures of the femoral neck, concomitant with progress in the treatment of fresh fractures. Nonunion is still a common occurrence, presenting a clinical problem which demands thoughtful study. Even following early diagnosis and treatment of the acute fracture by improved surgical methods, one must always anticipate a certain number of ununited fractures of the neck of the femur. The most optimistic figures place their incidence at 10 per cent. From inefficient treatment or none at all, an even larger number may be expected.

Ununited fracture of the neck of the femur is a condition which renders the patient a permanent invalid unless surgical treatment is undertaken. In the presence of a strong fibrous union, walking with a decided limp and more or less pain is possible, but the patient's endurance is poor. The majority of patients are totally disabled, requiring the use of crutches for support. Such a condition, however, can no longer be described as hopeless or unsurmountable by surgery.

An operation for ununited fracture of the neck of the femur should offer a reasonable assurance of (1) relief of pain, (2) sufficient stability for ordinary weight-bearing, and (3) a fair range of motion. To accomplish this, a firm bony support must be provided some portion of the upper extremity of the femur by one of the following operations: (1) osteosynthesis, (2) reconstruction, or (3) trochanteric osteotomy. The selection of the proper method of treatment is often difficult, taxing the ingenuity and judgment of the surgeon. The general condition of the patient must always be the primary consideration. The majority of these patients are over 60 years of age and are poor surgical risks for the more difficult and formidable procedures. Not infrequently they exhibit manifestations of disease of the cardiovascular system and urinary tract and signs of mental deterioration. Roentgenograms should be made in the anteroposterior and lateral planes with the extremity rotated internally as far as possible, and the existing mechanical and physiologic status of the hip must be studied with special thought for (1) the length of time since the original fracture, (2) the viability or nonviability of the head, (3) the extent of absorption of the neck, and (4) the amount of upward displacement of the trochanter. After the fresh fracture, the amount of absorption of the neck and the degenerative changes in the head of the femur increase with the lapse of time. Thus, the prospect of securing even a fairly accurate anatomic restoration becomes less favorable as nonunion continues.

OSTEOSYNTHESIS

Several factors govern the advisability of a bone graft or bone peg operation. The procedure is suitable chiefly for comparatively young individuals, being too extensive for elderly or debilitated patients. If treatment is instituted for nonunion in the early stage, union is likely to take place with less variation from the normal contour of the bone. Only moderate absorption and atrophy of the head and neck, a viable head, and relatively little upward displacement of the trochanter are conditions favorable for the operation. Less than 10 per cent of the cases of nonunion of the neck of the femur present these requisites; thus, the usefulness of the bone graft operation is limited. The method, however, has a definite place in the treatment of these fractures; in appropriate cases, osseous union and practically normal contour and function may be restored. The popularity of the bone graft procedure has waned to some extent, not only because less extensive operations are available, but also on account of the long period of immobilization required. Possibly fixation of the bone graft by metal pins might be more advantageous, the graft being employed for osteogenic purposes and the pins for better fixation, thereby lessening the period of confinement and the morbidity attendant upon prolonged immobilization in a cast.

If the nonunion is of more than two months' duration, the fracture site is exposed by a Smith-Petersen or Watson-Jones incision; in patients with nonunion of less than two months' dura-

*Read in Section on Bone and Joint Surgery, Southern Medical Association, Thirty-Fourth Annual Meeting, Louisville, Kentucky, November 12-15, 1940.

tion, the graft may be inserted under roentgenographic control without exposure of the fracture, provided little or no absorption of the neck has occurred and a satisfactory reduction can be accomplished.

By the above procedure, union is reported in from 60 to 70 per cent of the cases, although a subsequent osteo-arthritis impairs the functional result 25 per cent. Undoubtedly, the satisfactory functional results of this procedure are far superior to those of the best reconstruction operation and better than those of trochanteric osteotomy. The applicability of the operation, however, is limited to a small group of cases.

RECONSTRUCTION OPERATIONS

Reconstruction operations are indicated in the presence of a nonviable head with extensive degenerative changes, advanced absorption of the neck, and excessive upward displacement of the trochanter. Briefly stated, reconstruction operations are the least desirable of the three common types of procedures employed for ununited fractures of the neck of the femur, and are now undertaken only when the status of the hip contraindicates an osteosynthesis or a trochanteric osteotomy. The Albee and Whitman procedures have proven to be the most satisfactory. The Colonna operation has resulted in a weak hip without stability and with a tendency toward spontaneous dislocation of the trochanter from the acetabulum.

Approximately 60 per cent good or fair results and 40 per cent poor results are to be expected from reconstruction operations. The common causes of failure are displacement of the neck or trochanter from the acetabulum, gluteal weakness and a hip limp, arthritic changes and pain in the new joint, and a painful knock-knee deformity. Function following the best reconstructions is less satisfactory than those of osteotomies or bone peg operations.

TROCHANTERIC OSTEOTOMIES

Two types of osteotomies are employed for ununited fractures of the neck of the femur: (1) the high, or intertrochanteric osteotomy, and (2) the low, or Schanz osteotomy. The first is carried out just above the level of the lesser tubercle and the second through the shaft of the femur below the lesser tubercle, as a rule at the approximate level of the tuberosity of

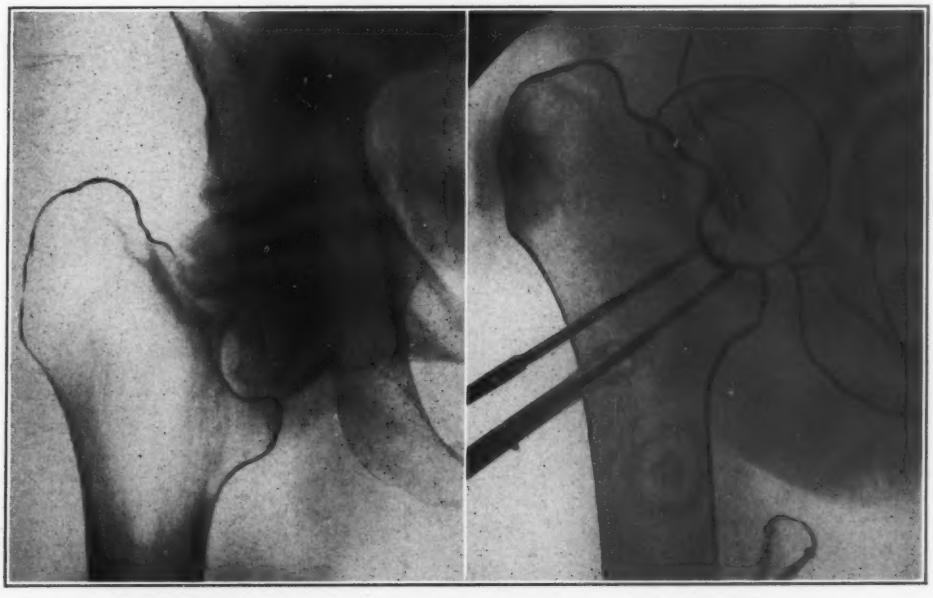

Fig. 1 A

Fig. 1 B

A, nonunion of the neck of the femur of 15 months' duration. B, technic is simple but exacting. Imperative that osteotomy be at proper level and at proper degree of inclination; roentgenogram shows drills in place to determine proper level. Note (in *Fig. 2 A*) that osteotomy was made at a less oblique angle than the angle at which the drills were inserted.

the ischium. The mechanical advantages gained by trochanteric osteotomy are as follows: (1) the weight-bearing pedestal is shifted into the weight-bearing line of the body, that is, beneath the sacro-iliac joint and the head of the femur. (2) The shearing force at the fracture site is reduced by diminishing the angle of inclination between the surfaces of the head and neck; in other words, the fracture line approaches a more horizontal than vertical position. (3) Following osteotomy, the position of the greater trochanter and the normal leverage action of the gluteal muscles are preserved.

In considering the indications for osteotomy versus reconstruction, further experience is necessary before positive conclusions can be drawn. In general, however, osteotomy is preferable to reconstruction for the following reasons: (1) The operation is simpler and safer, being particularly suitable for elderly and debilitated individuals who cannot withstand extensive reconstruction or bone graft operations. Definite improvement of an otherwise hopeless disability is thus possible. (2) The mechanics of osteotomy more closely restore anatomic weight-bearing in the hip than reconstruction. (3) Subsequent displacement and loss of support are less likely. (4) Function surpasses that of the best reconstruction and approximates that of osteosynthesis or the bone graft operation. (5) The number of good or fair results is higher, being approximately 80 per cent.

Osteotomies are contraindicated (1) when the requirements are suitable for a bone graft operation, or osteosynthesis; (2) if the fracture is of long duration and there is a small, absorbed head and extreme lateral or upward displacement of the trochanter, in which event a modified Albee reconstruction is preferable; or (3) in the presence of an obviously necrotic head with osteo-arthritis of excessive degree.

In the majority of cases, the high osteotomy is preferable to the low osteotomy, or that below the lesser tubercle, in that (1) the lower fragment is more easily placed and held in proper position; (2) the distal fragment is in contact with the head, which tends to prevent instability from anteversion of the neck; (3) there is less danger of increased shortening from displacement and overriding of the fragments; and (4) contact of the shaft with the head and neck frag-

Fig. 2 A Fig. 2 B

A (same as *Fig. 1*) postoperative roentgenogram showing medial displacement of shaft under the fracture site. B, same case, 9 months later, no union between head and neck, but a good functional result in that shearing angle at the fracture site has been eliminated. The head is non-viable, but has produced no symptoms and appears to be maintaining a status quo as regards degenerative changes.

Fig. 3 A Fig. 3 B Fig. 3 C

A, nonunion in patient aged 70. B, failure because of poorly executed operation; osteotomy too oblique to allow maximal amount of medial displacement. C, two and one-half months postoperatively, remnant of the neck has resumed its preoperative position, poor result.

ments may possibly promote union between all three, which is the ideal end result of an osteotomy.

The technic of the operation is as follows: if the lesser trochanter is slightly above the level of the lower border of the head, preliminary traction may be necessary for several days to decrease the shortening. The high osteotomy is performed at the level of the lower border of the femoral head, the desirable site being just above the level of the lesser tubercle on the shaft. Through a short lateral incision, a drill is inserted along the contemplated osteotomy line, which is slightly oblique. The exact level of the osteotomy is predetermined by an anteroposterior roentgenogram, the drill serving as a marker. After adequate exposure for visualization of the operative field, the shaft is divided at the predetermined point and displaced medially beneath the femoral head. Another roentgenogram in the anteroposterior view is made to check the position of the fragment. A double spica cast is then applied, maintaining the hip in slight abduction and flexion. Eight weeks of immobilization are sufficient. The low osteotomy is performed in a similar manner at a lower level.

Following osteotomy, solid osseous union was obtained between the head and neck of the femur in 15 of 30 of our cases. Although functional results are better if union takes place between all three fragments, or between the head and neck, satisfactory function ensues even though nonunion between the head and neck persists, since the new mechanics of the hip have eliminated shearing force at the fracture site, established a bony support, and provided an improved line of weight-bearing. The following table illustrates the influence of the viability of the head upon union between the head and neck, as observed in our cases:

Viable head	
Union	10
Nonunion	6
Necrotic head	
Union	5
Nonunion	9

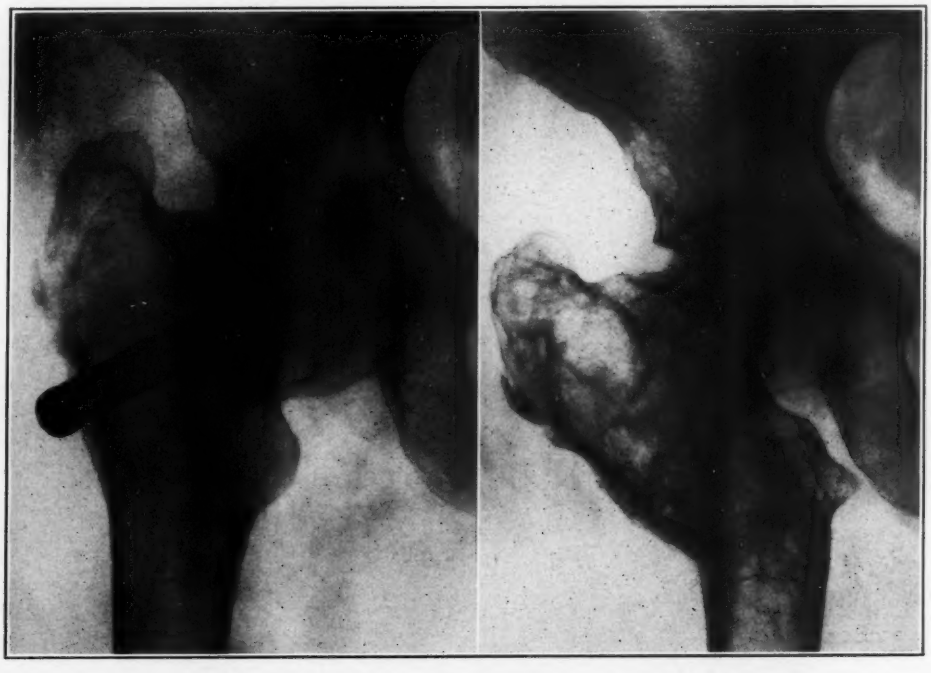

Fig. 4 A

Fig. 4 B

A, nonunion of the neck of the femur two years after insertion of Smith-Petersen nail elsewhere, patient aged 56. B, low osteotomy with union of neck to a necrotic head; despite degenerative changes excellent result at 18 months. Patient walks without support, has no pain, 50 per cent motion, moderate limp.

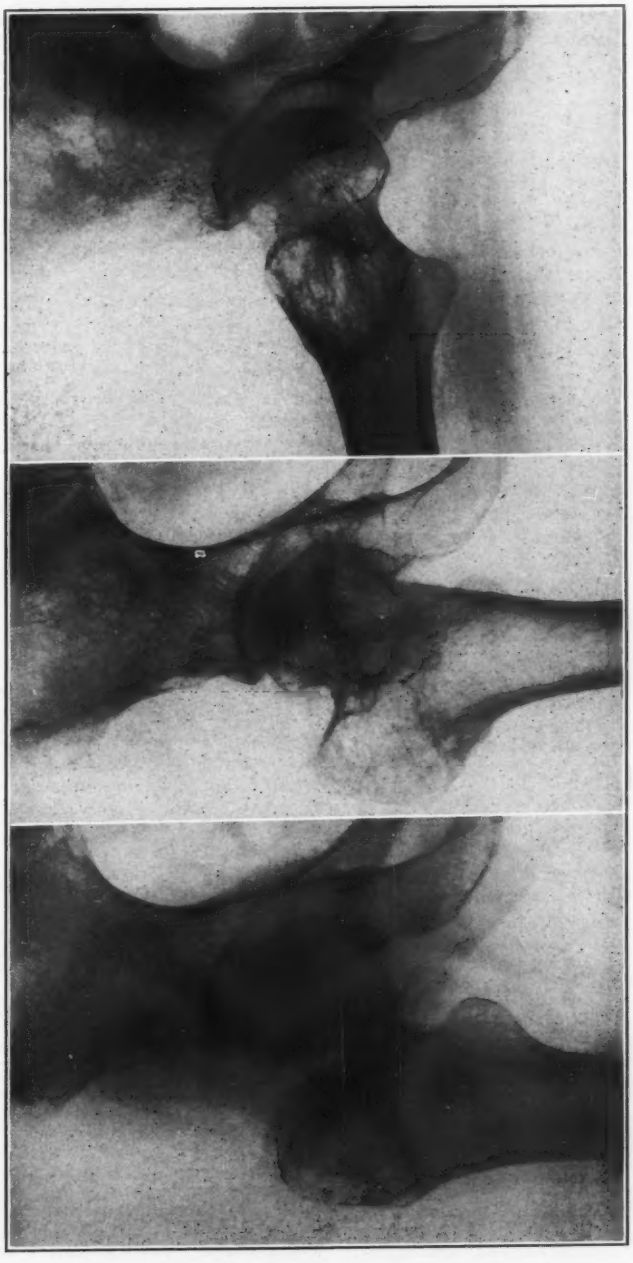

Fig. 5 A Fig. 5 B Fig. 5 C

A, nonunion of the neck of the femur of two months' duration in patient aged 60, requisites fulfilled for bone graft operation, but patient was a poor surgical risk. B and C, two years later, solid union between all three fragments in excellent relationship. This is as good result clinically and anatomically as could have been obtained by a bone graft operation.

Obviously, from these figures, union between the head and neck, or union between all three fragments with a far superior result is more likely if the head is viable.

Subsequent osteo-arthritic changes have been of minimal degree; of 7 patients, only 1 was in the poor result group. In preoperative roentgenograms, 14 heads were classified as nonviable. These have undoubtedly withstood weight-bearing better than a similar series of heads following a bone graft operation that became necrotic or the aseptic necrosis subsequent to fixation of fresh fractures of the neck of the femur. This maintenance of the status quo, or even improvement of the necrotic head, is attributable to mechanical, as well as physiologic factors: (1) reduction of the shearing force at the fracture site promotes union and secondary improvement in circulation; (2) lateral rotation of the head so that the portion adjacent to the fovea, which first shows creeping substitution or viable bone, forms the weight-bearing surface of the femur; (3) the possibility of revascularization of the head from the fresh osteotomy surface of the trochanter is greater than from a neck which, because of minimal blood supply, has difficulty in maintaining its own integrity. Some of the heads which show a relative increase in density probably are not entirely devoid of blood supply. They have not, however, sufficient blood supply to undergo the same degree of decalcification as the trochanter. In these borderline cases, the additional blood supply from the trochanter following osteotomy has resulted in a definite improvement in the head that is demonstrable in serial roentgenograms.

The average shortening of the whole series postoperatively was 1.3 inches. In 7 patients the length of the extremity was increased an average of 0.7 inch more than the preoperative amount of shortening, the greatest being 1¾ inches. Five patients, on the contrary, lost an average of 0.6 inch, the greatest decrease in length being 1¼ inches. The majority of patients showed neither loss nor gain over the preoperative amount of shortening.

An analysis revealed that 77 per cent of the patients obtained satisfactory function following trochanteric osteotomy, as follows:

Total number of patients, 30

Average age, 60 years

Result	No.	Per Cent
Good	16	53.3
Fair	7	23.3
Poor	7	23.3

The result was considered good if the patient could walk without support and had a good range of motion with little or no pain. The result was regarded as fair if the patient required the use of a cane for support because of slight weakness or instability, but had little pain and was able to resume reasonable duties and activities. If the patient had no better use of the hip than he had before osteotomy, the result was classified as poor; that is, if pain was excessive, or stability insufficient for weight-bearing, or motion limited to a few degrees.

Of the 7 fair results, 3 will probably graduate to the good result group; even with an excellent mechanical hip, eight months seems to be an arbitrary minimal period for establishing the ultimate result. This period must be extended for elderly patients in whom extraneous factors such as arthritis prolong the convalescent period.

Seven poor results can be analyzed as follows: three were in two persons with bilateral ununited fractures of the neck of the femur; the other 4 were mechanical failures as a result of poorly executed operations, or loss of medial support subsequent to removal of fixation.

In view of the relative simplicity of the operative procedure, the fact that there was no mortality in this series, the morbidity was low, and a reasonably high percentage of excellent results was obtained, we now feel that osteotomy offers a solution to the otherwise hopeless problem presented by ununited fractures to which reconstruction and bone graft operations are not applicable because of the extensive surgery involved; further, that, under proper conditions, osteotomy may be performed in preference to reconstruction, even though the patient's condition justifies the latter procedure. Perhaps the conclusions drawn in regard to osteotomy are premature, since our experience includes only 30 cases, but the results thus far have been sufficiently encouraging to warrant continued use of the operation when feasible.

DISCUSSION (*Abstract*)

Dr. Guy W. Leadbetter, Washington, D. C.—In the past seventeen years I have done Whitman operations in one hundred and fifty-two cases, and of that number 50 per cent are to be classified as good results, that is, stable hips, good motion, and the ability to walk with or without a cane, with the cane carried on the opposite side, or a return to gainful occupation.

The remaining 50 per cent are not classified as fair or poor; they are classified as poor, because they were painful hips. They were not particularly unstable hips, but they all had the so-called coxalgic gait. The hip

could not be shortened by pressure, or, rather, the leg could not, but the individual made an effort to center the body weight directly over the femur in order to support himself.

On examining these recently at varying periods, we found that the neck which had been transplanted into the acetabulum had become narrowed to a very short pyramidal shape, and was resting only on the upper rim of the acetabulum.

It seemed to us from that series and a study of those over a period of seventeen years, that the loss in the distal portion of the transplanted neck was probably due to the fact that we had interfered very materially with the circulation of that portion of the neck which comes through the great trochanter by resecting the trochanter and attempting to transplant it lower.

We have done ten cases of the Colonna type of reconstruction. Five of those are to be considered good. They are stable, the shortening is minimal, and the pain is minimal. Five are bad. Three of these had become dislocated, and we were unable to replace them satisfactorily in the acetabulum. Whether that was due to improper fixation following operation, or too short fixation, I do not know.

Only five osteotomies have been done, and those fairly recently, so it is not possible to evaluate from my angle the real results in those cases. However, it would seem from my own experience, and from what we have seen and heard here today, that osteotomy of some type in the trochanteric area, with the preservation of the greater trochanter and not attempting to transplant it, also the capital portion of the bone, would serve best to minimize the shearing force through the old fracture line to establish an inward angular pressure into the acetabulum and the valgus position beneath the head, and probably will do more than anything else to establish solid union.

The question of selection of cases is certainly one of difficulty. I believe that if I saw an early case of nonunion with a well preserved distal portion of the neck, I would still be inclined to do a Whitman procedure. If, on the other hand, I saw it fairly late, I rather think I would be inclined to do an osteotomy.

Reconstruction operations for treatment have not been entirely satisfactory and it presents a challenge at the door of all men interested in these cases to continue work along certain lines for the development of a reasonable procedure which will have as many of the normal functional elements of the hip joint in it as possible, namely, the preservation of the smooth contacting of the surfaces, a normal angulation into the acetabulum and not too great a shift of the weight-bearing line.

I think that the subject of the care of ununited fracture of the neck of the femur is still wide open.

Dr. F. A. Jostes, St. Louis, Mo.—It was my privilege to see some of the cases presented today at operation and again later to see the results. Among these were some of the earlier cases operated upon at the Campbell Clinic. The operations I witnessed came at a time when mistakes that were made in the early days of this method of treatment were being avoided. The procedure impressed me so that I have done a very small series of cases by comparison. I have not obtained union between the three fragments in any case, but we have good stable hips in all of the cases that were done. There was a little pain at times in a few cases.

Probably had I not had the advantage of the experience of the men at the Campbell Clinic I should not be able to say that our results were satisfactory.

To me it is the simplest procedure that has yet been offered for correction of this disabling condition, and I believe for the benefit of the patient, as well as for the operator, it probably offers better results than do the more complicated prolonged surgical procedures.

Dr. Paul C. Colonna, Oklahoma City, Okla.—I am very glad that Dr. Smith laid down clearly the indications that they have used for this osteotomy, because my problem has been centered primarily around the older type of ununited fractures, with frank necrosis of the head and absorption of the neck. As he clearly pointed out, those cases have marked shortening, adduction or flexion, and are not suitable cases for this osteotomy.

I was also interested in Dr. Leadbetter's tremendous series of Whitman reconstructions. It is a remarkable record for one man to have this large series.

The question of having had 50 per cent successes and 50 per cent failures in the type of reconstruction described by me in 1931 naturally interested me, and I hope to find out from him later the postoperative care that these patients had. I think the first six- or eight-week period after this operation is a very vital period in which these limbs should not be allowed to swing over into adduction.

I have approached the problem of old cases as one in which we wish to relieve the patient of pain and instability, to restore mobility, and, if possible, give increased length to the injured extremity.

I think shortening of the limb is marked in the osteotomy. It is not, possibly, a vital criticism, but it is a definite thing that we should like to avoid.

Dr. Smith mentioned that many of them had had equal length to that preceding the osteotomy. That is very good, but we should like to increase the length of these extremities more in order to compensate for the shortening that is present before operation.

Another problem that has worried me in osteotomies is this, and I should like to ask Dr. Smith this question: In his frank failures, of which he has had a few, what is his method of choice then? What operation is then possible? How does he treat them at that time?

Dr. W. Barnett Owen, Louisville, Ky.—An osteotomy, properly done, is the best solution at the present time of an ununited fracture of the neck of the femur. The procedure is simple, non-shocking to the patient and is productive of a stable hip, without pain, in the shortest time with the least danger. I feel quite sure we will adopt this procedure as routine treatment for painful, ununited fractures of the neck of the femur. There are some cases that have very little pain and a fairly stable hip and with the exception of a moderate amount of shortness and limp are not disabling. In that type of individual, no operation should be performed. It is only for the painful, unstable hip that this procedure is indicated. Our confidence has increased by observance of previous cases so treated.

I do not consider the problem finally and definitely solved, but at present we feel that this is the best solution of a bad situation.

Dr. Smith (closing).—In regard to Dr. Colonna's question as to what is the procedure of choice if the osteotomy fails, only one patient has been a sufficiently good surgical risk to employ any other procedure. In that particular instance, the L'Espiscopo and Albee procedure were combined; the neck fragment was osteotomized and turned inward into the acetabulum and the trochanter levered laterally; these two fragments were united to the shaft and the result was a very stable hip.

Of the reconstruction procedures, Dr. Colonna's operation has been employed twice; one was a failure, the other a good result. The large majority were Whitman reconstructions.

The results from osteotomy have been so encouraging that, with proper requisites, we intend to continue its use in preference to reconstruction.

CANCER OF THE RECTUM, SIGMOID AND ANUS*

A REVIEW OF 40 CASES SEEN DURING THE YEAR 1939

By HERBERT T. HAYES, M.D., F.A.C.S.

and

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This report is based on a series of 40 consecutive patients with cancer of the lower bowel seen during the year 1939. It includes 13 one-stage abdominoperineal resections of the rectum, 3 resections of sigmoid growths, 8 colostomies, 3 cases where electrocoagulation was used, 1 each where x-ray and radium were used, and 11 patients upon whom no surgery or treatment was done.

There were 4 deaths, a total mortality of 14 per cent. The death of one patient (Mrs. L. G. B.) is not included in the above figures. She was seen in consultation and died after operation by another surgeon. It is interesting to note that three of the four deaths were in elderly patients with marked hypertension (systolic pressure being well over 200) upon whom a simple palliative colostomy was done. Each died of hypostatic bronchopneumonia 14 days, 15 days and 3 months, respectively, after the operation. The other death occurred seven weeks after a one-stage abdominoperineal resection of the rectum, at which time the rectum was ruptured at the site of the growth during removal. The growth had also infiltrated the bladder wall. There was no peritonitis, but the wound and the urinary tract were badly infected, the latter being further complicated by the presence of a very large prostate gland. So 3 deaths of 8 colostomies is a mortality of 37.5 per cent, and 1 death in 13 one-stage abdominoperineal resections is a mortality of 7.7 per cent.

We realize that statistics from such a small series of cases are of little value, so we intend to introduce as few figures as possible. The discussion will be limited chiefly to complications and other unusual features of particular interest to the surgeon.

There were 19 males and 21 females. The average age was 55. The anal canal was involved in three instances; the remaining growths were in the rectum or sigmoid.

In the group of patients who had resections of the rectum it is interesting to note that all were one-stage abdominoperineal resections. We feel that this is superior to other types of operation on patients who are good surgical risks. One must fit the operation to the patient, however, and must be ready to do one of several different procedures as the occasion demands. Only one of the colostomies was done with the idea of doing a two-stage operation (M. R. W.). This was later found to be impossible. The remainder were simple palliative colostomies. The loss of three of the eight will testify that the patients were very poor risks, since the ordinary colostomy is not a particularly formidable procedure.

We would like to emphasize that all patients are poor surgical risks without careful preparation, chiefly a complete and thorough decompression of the large bowel. At least a week is required for daily saline laxatives and colon irrigations. The term "irrigation" is to be sharply distinguished from "enema." The former requires four to six gallons of water given through a Y-tube irrigating apparatus twice a day. We have found the hospital irrigations quite inadequate unless a trained attendant gives them. The patient is given a high caloric low residue diet with particular reference to the vitamins, as many of these patients have been partially obstructed and are suffering from malnutrition. We feel sure that two or three weeks of preparation is better than one week, although we do not rigidly adhere to this. Other major steps in the routine include complete narcotization, spinal anesthesia with 20 mg. of pontocaine, infusion of glucose and saline during the operation, and a blood transfusion that is usually

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*Read in Section on Proctology, Southern Medical Association, Thirty-Fourth Annual Meeting, Louisville, Kentucky, November 12-15, 1940.

started before the patient leaves the operating table. Sodium ethyl thiobarbiturate should always be available for completion of the anesthetic if the spinal wears out before the operation is finished. A Foley retention catheter is always inserted before the operation and is left in place for about two weeks. In the rare cases of complete obstruction a cecostomy should be done and a resection about 3 to 4 weeks later.

Among the patients who had a resection of the rectum we find that several unusual conditions arose. One man (T. H. G.) had an implant about 3 centimeters in diameter in the abdominal wound after the latter had healed. The rectal growth had adhered to the sacrum and was loosened with difficulty. No doubt the cancer cells were carried to the abdominal wound on the fingers. The implant was removed with the electrosurgical unit, radium applied to the base, and healing was rapid. The perineal wound of this man was unusually painful, but healed fairly rapidly until seven weeks after the operation, when it split wide open again after a short auto trip. It then took about six weeks to heal. He is in good condition one year and ten months after operation.

Another man (F. B.) survived an attack of postoperative peritonitis only to develop an acute intestinal obstruction six months after operation. He had had some signs of mild obstruction in the meantime. At operation for the obstruction a loop of small gut was found kinked and tightly adhered to the sigmoid just before the latter penetrated the abdominal wall to become the colostomy. Convalescence from this was uneventful. Incidentally this is the only case of peritonitis we have had in the entire series.

During the three months since operation one patient (Mrs. J. T. B.) has survived an attack of pulmonary embolism and two attacks of coronary thrombosis. She is now up and about. She was advised to have a resection after microscopic sections of an excised rectal polyp showed malignancy throughout. After removal of the rectum, cancer cells were found in the muscularis at the previous site of the polyp.

We make it a point to have serial sections made through the base of the removed polyp. If the base is malignant we think usually a resection should be done, but if it is not in the base we feel justified in removing only with the coagulating snare and do not advise a resection.

While doing the perineal portion of the resection on another man (H. E. R.) the middle sacral artery was ruptured and bleeding was profuse and alarming before it could be controlled. The pelvis was small and the bleeding point high, and it was technically difficult to clamp. This man was given five blood transfusions before operation and two immediately after operation, a total of 3.5 quarts of blood.

We should like to mention a case seen in 1939 upon which we have since operated. A woman, aged 55 (Mrs. W.) evidently had an endometriosis, as she had two large chocolate cysts. The pelvic organs were matted to the rectum and the pelvic floor. The rectum was removed with great difficulty and we considered it a surgical feat to be able to remove it at all. We can readily see how an endometriosis could be a contraindication to a resection before the menopause.

Another lady (Miss G. S.) was a severe diabetic at the time of operation. She developed an osteomyelitis of the coccyx and the coccyx had to be removed. She also had a retention of urine for eight weeks following the operation. Healing in this case was unusually slow and required about four months.

In two of the above resections too much sigmoid was brought out as a colostomy and about two inches of the excess had to be cut off in about ten to fourteen days. This can easily be done with the electrosurgical unit. It was found advisable to infiltrate the muscularis of the sigmoid with procaine hydrochloride because if this is not done there is some discomfort when the clamps are applied.

Of the three patients who had resection of sigmoid growths all of the procedures are completed upon only one (A. F. E.). This man had a severe hemorrhage after the spur of the Devine colostomy was crushed and the clamp removed. This spur, let us remind you, is an-

40 CASES CANCER OF RECTUM, SIGMOID AND ANUS

Patients	Operation	Deaths	Mortality Per Cent
13	One-stage abdominoperineal resection of the rectum	1	7.7
3	Resection of sigmoid		
3	Electrocoagulation		
2	Radium and x-ray		
8	Palliative colostomy	3	37.5
11	No surgery		

Table 1

RESECTION OF RECTUM

One-Stage Abdominoperineal

No.	Patient	Age	Location Growth	Diagnosis	Metastases	Complications	Result	Remarks	Mortality
1	F.E.S.	65	Rectosigmoid	Adenocarcinoma	Mesenteric lymph nodes; bladder wall	Infected wound and bladder; big prostate; sepsis	Died in 7 weeks	Rectum ruptured at site of growth during removal	1
2	T.H.G.	51	Above recto-sigmoid	Adenocarcinoma Grade III	Local extension	Implant in abdominal wound	Good for 1 year	Perineal wound split open 7 weeks after operation	
3	A.B.	65	Rectum	Adenocarcinoma Grade II	No	No	Good for 9 mos.		
4	F.B.	54	Rectum	Adenocarcinoma Grade II	No	Peritonitis; intestinal obstruction	Good for 7 mos.	Operation for obstruction 6 months later	
5	Mrs.J.T.B.	56	Rectum	Adenocarcnoma Grade III	No	Coronary thrombosis; pulmonary embolus	Good for 3 mos.	Very painful perineal wound; cancer cells in base of polyp	
6	J.G.C.	46	Rectum	Adenocarcinoma Grade II	No	No	Good for 1 year		
7	Mrs.B.R.McL.	57	Rectum	Adenocarcinoma Base polyp Grade II	No	No	Good for 11 mos.		
8	H.E.R.	59	Rectum	Adenocarcinoma Grade III	No	No	Good for 9 mos.	Rupture middle sacral artery; 7 transfusions given (3.5 qts.)	
9	MissG.S.	58	Rectum	Adenocarcinoma Grade II	No	Osteomyelitis coccyx	Good for 1 year	Severe diabetes. Coccyx removed. Prolonged healing about 4 mos. Retention of urine 8 weeks	
10	T.C.W.	58	Rectum	Adenocarcinoma Grade III	No	No	Good for 7 mos.		
11	Mrs.L.E.	52	Rectum	Adenocarcinoma Grade II	No	No	Good for 1 year	Colostomy shortened later	
12	T.C.J.	54	Rectum; anal canal	Adenocarcinoma	No	Urinary retention and infection; chills and fever	Good for 2 mos.	Retention catheter on 3 occasions	
13	Mrs.W.P.M.	51	Rectosigmoid	Adenocarcinoma Grade II	Local extension	No	Good for 3 mos.	Colostomy shortened later	7.7%

Table 2

RESECTION OF SIGMOID

No.	Patient	Age	Diagnosis	First Procedure	Second Procedure	Third Procedure	Fourth Procedure	Complications	Result
1	Mrs.G.C.L.	38	Adenocarcinoma	Devine colostomy	Resection of growth with end-to-end anastomosis	Spur to be crushed and colostomy closed		No	Excellent to date
2	A.F.E.	63	Adenocarcinoma	Devine colostomy	Resection growth; made colostomy proximal end and closed distal end	Spur of Devine colostomy crushed	Devine colostomy closed	Hemorrhage after crushing spur	Excellent 6 mos.
3	Mrs.A.P.	58	Adenocarcinoma Grade III	Devine colostomy	Resection growth; both ends brought out with creation of a spur	Spur crushed; other steps to be done later		No	Good 4 mos.

Table 3

ELECTROCOAGULATION

No.	Patient	Age	Location Growth	Diagnosis	Indications for Fulguration	Procedure	Result	Remarks
1	J.P.H.	58	Rectum posterior wall. Level third valve. Size silver dollar	Adenocarcinoma Grade III	Refused surgery	Fulgurated 5 times over period of 17 months, last time April. 5, 1939	Healed to date. Slight constriction at site	
2	F.C.M.	46	Rectum. 3 polypi 9, 12 and 16 cm. from anus	Adenocarcinoma Grade II	Refused surgery. Returning to South America	Upper polyp fulgurated and lower 2 snared off and bases fulgurated	Local result excellent	
3	Mrs.G.W.	49	Rectum from dentate line 2 in. up rectal wall	Squamous cell carcinoma Grade IV	Palliative procedure; growth fixed	Growth resected and fulgurated	Good local result	Radium applied to carcinoma of forchette elsewhere 2 mos. previously

Table 4

RADIUM and X-RAY

No.	Patient	Age	Location	Diagnosis	Radium	X-Ray	Result
1	Mrs.H.O.H.	36	Anal polyp	Carcinoma Grade I	4 radon seeds to base		Healed
2	R.R. (Col.)	70	Fistulectomy scar	Colloid carcinoma		Yes	Good to date

Table 5

noyingly inaccessible when bleeding occurs. In this instance an anoscope was inserted in each stoma of the Devine colostomy, through which several yards of 2-inch bandage were passed and packed as tightly as possible on each side of the spur. Whether this packing or a coincidental shock stopped the bleeding will never be known, but the patient survived and is in good health to date. He has a hernia at the site of the Devine colostomy.

The growths of the other two patients have been resected, but other procedures are to be done. An end-to-end anastomosis was done on one and a modified Mikulicz on the other. In each case the Devine colostomy is yet to be closed. We felt there was danger of recurrence and have consequently waited to close the colostomy.

There were three patients whose growths were electrocoagulated. Two of these refused a resection and in the other case fulguration was simply a palliative measure for a hopeless condition. A patient (J. P. H.) was fulgurated five times over a period of 17 months and has remained well for nearly a year. It might be said that we were a bit conservative in this case, but on the other hand one should not get too bold with a high growth, because the rectum can be easily penetrated with a resulting peritonitis. The other patient (Mrs. G. W.) had a large squamous cell carcinoma which probably originated at the dentate line. It was fixed

NO SURGERY

No.	Patient	Age	Location Growth	Diagnosis	Remarks
1	D.E.B.	41	Pelvic colon	Carcinoma	Entered government hospital
2	E.F.D.	55	Colon	Carcinoma	Has had nothing done
3	Mrs.J.B.B.	50	Rectum	Carcinoma; colostomy done elsewhere	Relieved some with cobra venom
4	Mrs.J.P.B.	62	Rectum	Adenocarcinoma Grade III	Operation advised
5	Mrs.H.M.H.	55	Rectum	Adenocarcinoma Grade III	Operation advised
6	Mrs.J.T.M.	46	Rectum	Adenocarcinoma Grade II	Operation advised
7	C.E.H.	37	Rectum	Adenocarcinoma of polyp Grade III	Examined 1 year after removal of polyp and rectum normal
8	Mrs.L.G.B.	61	Rectum	Adenocarcinoma Grade IV	Died 1 week after operation by another surgeon
9	Mrs.W.H.D.	56	Rectum	Adenocarcinoma Grade I	Fixed. Inoperable
10	H.C.DeV.	49	Rectum	Adeoncarcinoma Grade III	Operation advised
11	Mrs.V.H.	52	Rectum	Direct extension from adenocarcinoma. Cecum operated 1 year ago	Hopeless at present. Palliative colostomy later

Table 7

COLOSTOMY

No.	Patient	Age	Location Growth	Diagnosis	Indications	Complications	Result	Remarks	Mortality
1	M.R.W.	65	Sigmoid	Adenocarcinoma	Adherent to small gut and bladder. Metastasis to liver. Complete obstruction	No	Fair for 1 year		
2	Mrs.L.T.	72	Sigmoid	Adenocarcinoma	Frozen pelvis	Evisceration of omentum. Bronchopneumonia	Died in 3 mos.		1
3	O.R.	81	Rectum	Adenocarcinoma	Partial bowel obstruction	Bronchopneumonia Cardiac failure Hypertension	Died in 14 days		1
4	Mrs.E.D.H.	68	Rectum	Adenocarcinoma Grade II	Metastasis to mesentery and to liver	Bronchopneumonia Hypertension	Died in 15 days		1
5	Mrs.M.B.	35	Rectum	Adenocarcinoma Grade II	Frozen pelvis	No	Good for 1 mo.	Patient left city	
6	Mrs.C.K.K.	58	Rectum	Adenocarcinoma	Frozen pelvis. Metastasis to liver	No	Poor for 3 mos.		
7	T.R.	49	Rectum	Adenocarcinoma	Adhered to bladder and side pelvis	Opening in bladder and rectum. Both closed in one week	Fair for 2 mos.	Deep x-ray therapy before operation	
8	Mrs.V.L.	59	Rectosigmoid	Adenocarcinoma Grade III	Obstruction 2 years after fulguration of malignant polyp	No	Excellent 1 year		37.5 per cent

Table 6

and inoperable, so fulguration was done in the hope of making her more comfortable. An interesting feature in this case was the fact that radium had been applied by a skin specialist to a squamous cell carcinoma of the fourchette two months previously.

Radium was used in one case (Mrs. H. O. H.). An anal polyp had been removed which showed a low-grade malignancy. Serial sections showed no malignancy of the base. It was felt safer to apply radium to the base. This was done in the form of four radon seeds. Healing was uneventful. We wish to remind you that while malignancy is a common and frequent occurrence in rectal polypi, it is a rarity in anal polypi. The latter is usually an hypertrophied papilla. The other patient was a colored man, aged 70, who developed a colloid carcinoma in an anal fistula. He was given deep x-ray therapy.

As stated above, there were eight patients upon whom a colostomy was done. A glance at the chart will show that nearly all were hopelessly inoperable. A man (T. R.) survived a rent in the gut and one in the urinary bladder which were made in an effort to free the growth. A retention catheter was inserted, but urine drained from the wound for about a week. He had been given deep x-ray therapy in another city before consulting us. A colostomy was done upon another patient (Miss V. L.) because of obstruction two years after fulgura-

tion of a malignant rectal polyp. At the time of fulguration the rectum was probably penetrated with consequent abscess formation in the hollow of the sacrum because she was quite ill with chills and fever for about two weeks. Radon seeds were planted in the base. Gradually increasing obstruction occurred at the site of fulguration so that at the time of colostomy the lumen would admit an instrument no larger than an ordinary lead pencil. It has been one year since the colostomy and three years since fulguration and she is in excellent health. This patient was not resected because of her poor general health.

Of the eleven patients upon whom no surgery was done operation was advised in five instances, but nothing further was heard from them. One entered a Government hospital. Two were inoperable and a palliative colostomy will probably be done later. A man was examined one year after removal of a malignant polyp and the rectum was normal. A woman (Mrs. J. B. B.), who had a colostomy done elsewhere for an inoperable growth, consulted us relative to relief of pain. A chordotomy was advised, but she declined. Then cobra venom was prescribed and she obtained some relief. This patient had had a polyp, a section of which was reported nonmalignant, yet she developed a fast-growing malignancy that was inoperable in about 6 months.

We have used cobra venom in a few cases with some success, but feel that if possible its use should be started before the opiate habit is acquired. According to the manufacturers, it has been found

"efficient in relieving the severe pains of inoperable tumors, tic douloureux and of other intractable pains. The action of cobra venom is slower than that of morphine, but of longer duration. The drug does not produce the addiction and withdrawal symptoms of opium narcotics."

For short anesthetics or for supplementing spinal anesthetics when the latter wear off in long operations, we recommend the use of sodium ethyl thiobarbiturate as an intravenous anesthetic. We have used it a number of times and have been favorably impressed. From our point of view the chief advantage is that there is no increase in bleeding such as occurs when a spinal anesthetic is supplemented with a general anesthetic. As you know, bleeding can be a real problem when one is working deep in the pelvis.

SUMMARY

(1) A review of 40 consecutive patients with cancer of the lower bowel has been presented. Emphasis has been placed upon complications and unusual features.

(2) Careful preoperative preparation is imperative in all cases of cancer of the bowel.

(3) Electrocoagulation is useful in cases of pedunculated malignant polyps when the base is not involved, patients who cannot withstand radical surgery, and inoperable cancer.

(4) Cobra venom is recommended for relieving cancer pain and sodium ethyl thiobarbiturate as a supplementary anesthetic.

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Discussion follows paper of Dr. Graham, page 816.

PRACTICAL CONSIDERATION OF CANCER OF THE SIGMOID AND RECTUM*

By A. STEPHENS GRAHAM, M.D.†
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The purpose of this paper is to discuss some of my experiences on the personal side rather than the scientific during the preoperative period in carcinoma of the distal segment of the colon and rectum. I should like to relate some of my problems in connection with the diagnosis, determination of operability, choice of procedure, and discussion with the patient of the pathologic findings and the treatment proposed, including an explanation of colostomy.

Diagnosis.—Since operations for carcinoma make up nearly 70 per cent of the surgery upon the large intestine, it would seem advisable when the presumptive evidence even slightly suggests malignancy that the lesion be so considered until proven otherwise. Lack of care in questioning patients probably results in more failures of diagnosis, or at least failure of diagnosis until a late stage of the disease, than any other single factor. There are, in my opinion, only three definitely significant symptoms of carcinoma of the distal portion of the large intestine and rectum, namely: passage of bright blood from the rectum either with stool or alone; progressively increasing difficulty in the ability to

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evacuate the bowels, and periods of such difficulty alternating with periods of frequent evacuations of a fluid nature. Simple in their manifestations and easily recognizable, these symptoms nevertheless are often overlooked or, if noted, misinterpreted. Blood in the stool, for instance, had been noted previously in less than half of my patients with carcinoma of the sigmoid or rectum. Yet by careful questioning and observation it was possible to determine that over 95 per cent of them were actually passing blood. Of those in whom this finding had been observed by the first physician consulted, approximately one-third were assumed to be bleeding from hemorrhoids, for which treatment had been instituted. Although increasing difficulty in effecting satisfactory evacuation of the bowels had been noted in most instances, the significance of this fact was not realized. When, however, in addition to constipation, the patient admitted the presence of blood at stool, the attending physician usually suspected carcinoma. Had the long-standing, intractable constipation been recognized as a probable sign of carcinoma, relatively simple investigation would have disclosed rectal bleeding. It is quite evident, therefore, that meticulous questioning of each patient is essential.

My experience has been that to the inquiry, "Have you ever passed bright blood at stool?" the patient not infrequently answers, "No." Yet to the next question, "Do you notice the passages from your bowel?" the reply is just as often in the negative. Such inconsistency has led me to require patients whose complaints suggest disease of the large intestine to observe their stools carefully or to enter the hospital that we may make such observation.

The expressions, "constipation" and "diarrhea," are a source of considerable uncertainty when talking with the patient. An individual will often deny constipation, notwithstanding frequent ingestion of large quantities of cathartic medicine because of inadequate defecation; in fact, he often states he is bothered with diarrhea. Consequently, the usual question, "Do you have a daily bowel movement?" or "How often do your bowels act?" is insufficient. The average patient is likely to consider anything diarrhea, from incessant desire to go to stool to ten or more copious, watery evacuations a day.

Actually, however, diarrhea seldom occurs. The frequent discharges usually consist only of a minimum quantity of watery matter, mucus, and probably blood which, as a matter of fact, characterize the so-called compensatory or pseudodiarrhea which develops before onset of complete obstruction. Careful interrogation of patients will often disclose a history of preceding protracted costiveness for which they resorted to strenuous purgation. Many of my patients had been treated over long periods of time for amebic dysentery, chronic ulcerative colitis, and so-called mucous colitis, with a considerable variety of drugs and vaccines. Some had been diagnosed as neurotic with spastic colon. Yet in nearly every instance a constricting lesion could be detected with the examining finger, and in the remainder the lesion was readily observed through the sigmoidoscope. Moreover, inspection of the rectal discharge of these patients demonstrated that in most cases the quantity of the individual discharge rarely exceeded half an ounce and the amount of fecal material expelled in twenty-four hours seldom totaled 1 ounce. The bulk of the substance was mucus.

In the final analysis the diagnosis will depend upon careful examination of the patient by methods available to every physician, namely: digital examination and proctoscopic visualization of the rectum and lower sigmoid.

Operability.—The term operability as employed here implies conditions favorable and unfavorable to the removal of malignant growths in the sigmoid or rectum. Operability cannot be determined conclusively unless the abdomen is explored, and even then, owing to local fixation of the segment of bowel which harbors the growth, the decision may have to be deferred. Factors which most frequently influence operability are age, loss of weight and anemia, general debility, specific diseases such as diabetes and tuberculosis, size of the growth, fixation of the involved segment of bowel, and metastasis.

Age in itself is an unsatisfactory criterion by which to judge a patient's ability to withstand resection of the colon or rectum. Some of my patients aged 65 years or more have proven to be better surgical risks than others who had not yet reached 50; as a matter of fact, three who were older than 75 years stood resection unusually well. I am, however, in full accord with the prevailing opinion of most surgeons, that few patients over 60 years of age constitute good risks for the radical abdominoperineal operation.

Excessive loss of weight and marked diminution in concentration of hemoglobin, when the lesion is in the distal portion of the large intes-

tine, indicate in many cases metastasis to distant organs. That too much significance should not be attached to such findings, however, is illustrated by the following experience with five consecutive cases of carcinoma of the sigmoid or rectum which were hospitalized about the same time and which I reported several years ago:

In *Case 1* the weight was normal, hemoglobin 96 per cent, and the condition was inoperable because of marked glandular and hepatic metastasis.

In *Case 2*, there had been a 24-pound weight loss, hemoglobin was 72 per cent, the condition was definitely operable (these patients were operated upon on consecutive days, the first being considered operable and the second questionably operable).

In *Case 3* the weight was normal, hemoglobin 102 per cent, there was distinct glandular involvement, and the patient died nine months after palliative resection.

In *Case 4*, there had been a recent gain in weight, numerous moderate rectal hemorrhages, hemoglobin was 106 per cent, and the condition was operable.

Case 5 had had a 30-pound weight loss, numerous moderate rectal hemorrhages, hemoglobin 76 per cent, and was definitely operable. It is quite evident that repeated hemorrhages in one instance produce secondary anemia and in another stimulate production of hemoglobin.

Some surgeons consider advanced age and general debility important influences in determination of operability and that freedom from such diseases as tuberculosis, diabetes, cardiorenal disease and syphilis are essential. One might hesitate to operate in cases of hernia, uterine fibroids, or chronic disease of the gallbladder should these conditions be complicated by serious systemic disturbances such as have been mentioned and if the risk appeared unusually high; these patients might be rendered comfortable for many years on a nonsurgical regimen. On the other hand, a patient with carcinoma of the large intestine, who is not treated, is faced with the certainty of death after a relatively long period of progressively increased suffering which will vary in severity with the degree of obstruction, situation of the growth, and the nature of its metastasis. With the inclusion of these cases the burden of responsibility naturally is decidedly increased and the mortality rate augmented, but I have not seen fit to deprive these sufferers of the hope of cure. Although some have succumbed, a larger number have not only survived, but have attained an improved state of general health. I have known a small group of patients who appeared hopelessly inoperable or tremendous surgical risks, yet they survived operation and lived three or more relatively comfortable, useful years. Consequently, when on occasion I find myself hesitating, I recall these people or observe the specimens removed from them, and am encouraged to attempt another.

The size of carcinoma of the large intestine is a poor index of its curability. A patient upon whom I performed a radical resection of the rectum for a growth which almost filled the ampulla and who had been advised by other physicians to accept palliative colostomy without exploration of the abdomen, is in excellent condition six years after resection. In another instance, however, a patient who was operated upon several months later for a lesion only 2½ centimeters in diameter which was freely movable, succumbed within eleven months to distant metastasis. These observations are in accord with the findings of Rankin and Olsen in a study of 453 cases of carcinoma resected from the colon which led them to conclude that the size of the growth has little, if anything, to do with its prognosis.

Local fixation of an involved segment of bowel may influence one to consider the growth inoperable, although experience has proven that immobility results far more often from inflammatory resection than from malignant extension. A seemingly inoperable lesion at primary exploration has often become definitely operable after sidetracking the fecal current and instituting frequent daily irrigations with warm solutions over a period of two or three weeks.

Seldom can inoperability, the result of metastasis, be ascertained prior to exploration of the abdomen. Far too frequently examination is not made of the inguinal glands, to which malignant growths in the lower rectum or anal canal commonly spread. Just recently a patient, referred to me, was told that he had early, operable carcinoma of the rectum and that his only chance of a cure was radical surgery, necessitating permanent colostomy; radiotherapy, he was told, would at best be only a palliative measure. The growth appeared undoubtedly to be an early one, but the inguinal glands, which had not been examined previously, were found to be involved. A palliative resection was contemplated, but widespread hepatic involvement made this procedure unwise, and as a consequence of previous advice the resort to roentgentherapy left the patient without a shred of hope.

Choice of Procedure.—In my opinion there should be no hard and fast rule governing the selection of a procedure directed toward cure

of carcinoma of the rectum and rectosigmoid. I was recently told by a surgeon who lived in a small community several hundred miles from the nearest surgeon accustomed to performing the abdominoperineal operation in one stage, that he had had a conversation with one of the leading advocates of this procedure. The surgeon from the rural community was informed that it would be a grave error for him to undertake a lesser procedure upon his patients with carcinoma of the rectum, even if it meant foregoing all operations other than palliative colostomy. Yet a perusal of the experience of many of the foremost surgeons in this field, men such as Rankin, the late Daniel Fiske Jones, and Miles, to mention only a few, reveals that they first mastered the less radical, posterior resection and that for their patients considered to be poor risks they continued to employ this valuable procedure. If the surgeon, whose opportunity to perform resections of the rectum is limited, will employ a multiple-stage operation, he probably will have more patients alive out of any given number at the end of three and five years than if he had employed the more radical one-stage procedure with its considerably augmented mortality rate in the hands of an occasional operator.

My experience has paralleled that of many other surgeons who started with posterior resection and finally concluded that with increased experience the combined abdominoperineal operation was in most instances a less difficult technical undertaking. I am in full agreement with Daniel Fiske Jones, who pleaded

> "for a 'sufficiently thorough' operation for every patient who can stand it;"

with T. E. Jones when he said:

> "It is an error to perform small operations for small cancers and big operations for big cancers";

and with Rankin, who said that

> "There will always be patients who are not sufficiently strong to withstand the ideal operation (Miles') and many surgeons have not had sufficient experience to undertake it."

What to Tell the Patient.—The answer to the question: "What should the patient be told?" involves moral philosophy, an understanding of human psychology, and to a great extent the personality and temperament of the individual who attempts to give the answer. Among laymen and physicians alike there is, and probably always will be, a wide diversity of opinion as regards the answer to this question. Patients themselves have convinced me that suppression of the facts to some degree is, in most instances, not only justifiable and more kindly, but also a definite and valuable adjunct to whatever remedial measure is employed. Several years ago I discovered carcinoma of the rectosigmoid in a highly intelligent, middle-aged woman who had, a year previously, written a letter to the editor of a magazine in which she stated in no uncertain manner her deep conviction that persons afflicted with cancer should be told the truth. I therefore intimated to the patient that from gross observation the growth was in all probability malignant. She, however, adroitly maneuvered me subsequently into denying that it was actually cancerous, but that it would undoubtedly become so eventually. She confided to her husband that had the growth proven to be malignant, she would have made no effort to recover from operation. Moreover, she warned a friend whom she referred to me because of a nodule in the breast not to be alarmed if at first I seemed to suspect cancer, as that was apparently a characteristic of mine.

My patients, with few exceptions, have accepted without question the statement that there exists a precancerous lesion of a polypoid nature, or when actual obstruction was present, an ulcer which produces a stricture. Permission to establish permanent colostomy is invariably obtained, although the patient is advised of the scant possibility that either colostomy will prove unnecessary or will be of a temporary nature, owing to the fact that (1) the growth may be sufficiently high to warrant anterior resection, (2) the stricture may respond to dilatation, or (3) it may be possible after the fecal current has been sidetracked to destroy the polyp by fulguration or radiotherapy. These qualifying statements are made in order that failure to resect inoperable carcinoma of the sigmoid or rectum will not enlighten the patient as to the hopelessness of his situation, as in the case of the man to whom I referred whose lesion had metastasized to the inguinal glands.

Colostomy.—It is my belief that colostomy is a basic part of any operation which offers the best chance of longevity to the individual suffering from cancer of the rectum or rectosigmoid; consequently, its acceptance on the part of the patient is a necessary prerequisite to my operation upon these people. The average patient's abhorrence of colostomy can be overcome readily by anyone who is himself convinced that it is a tolerable state, compatible with a normal, comfortable, contented, useful and prof-

itable existence. Infinite tact and patience will be rewarded by almost invariable acceptance of the artificial abdominal anus. My experience has been that it is much less difficult to secure this acceptance than it is to reconcile the patient to a life of colostomy. I have found, however, that this can be accomplished best by soliciting the cooperation of a carefully instructed, selected group of nurses and orderlies and accepting the assistance of former patients with colostomy. Six individuals in the latter category, a minister, a newspaper reporter, a railroad engineer, an elevator operator, a prominent business man, and the wives of two of these, as well as another minister's wife, have volunteered to visit my patients during the preoperative and convalescent periods. The psychologic effect of actually seeing and talking with a person in one's own walk of life who has for months or years possessed colostomy is indeed most salutary and reassuring. Moreover, it is not uncommon for these good Samaritans to show greater serenity of mind and satisfaction with their lot than they actually feel and in so doing they really help themselves as well.

Valuable as is the assistance of these laymen in the re-establishment of a more nearly normal mental outlook on life, it is not, however, sufficient to make certain the patients complete and satisfactory adaptation to life with an artificial anus. In my experience, rehabilitation, both mental and physical, has been most quickly accomplished in those patients who have received the most careful and detailed instruction while in the hospital. Starting about the tenth postoperative day, my patients are urged to observe the process of changing the dressings about the colostomy. As soon as their strength will permit, they are asked to perform the procedure themselves with the aid of a nurse or orderly, and before leaving the hospital they demonstrate to me their ability to do so. During this period of instruction, the practical nurse or relative who is to assist in the home, is requested to become thoroughly familiar with all the problems incident to a life of colostomy and the means of overcoming these problems. They are fully covered in a mimeographed instruction sheet where answers can be found to practically every question which the patient may ask, such as means of overcoming constipation or diarrhea, alterations in diet, recommended utensils, materials, and drugs. Finally, these patients are encouraged to return to my office at frequent intervals, at which time their morale can be bolstered up and errors either of omission or commission can be corrected. This process is time-consuming and tedious for the surgeon who undertakes it, but almost invariably it enables him to fulfill an assurance made to the patient in the preoperative period of complete restoration of a normal manner of living.

Stuart Circle Hospital

DISCUSSION (*Abstract*)

Papers of Drs. Hayes and Burr and Dr. Graham.

Dr. Raymond L. Murdock, Oklahoma City, Okla.—I would like to mention some of the unusual features in my last fifty resections covering the period of about two years since a number of you after the Southern Medical Association meeting in Oklahoma City saw me do a one-stage combined abdomino-coccygeal resection for rectal malignancy, with sliding of the functioning colon to the anus left in place. Some of you examined this man preoperatively and others have done so recently. He is apparently in good health now and is sufficiently continent to decline any plastic tightening of the posterior defect in his sphincter. This is approximately the condition and attitude of a majority of the 19 cases upon which I have done this type of resection. The greatest number of this type of resection with perineal outlets have been done by Lt. Wayne Babcock. Seven of my last thirteen resections have been this type. I was fortunate in having operative recovery in my first four patients, one of whom died with recurrence while three are alive now postoperatively, 3½ years, 4 years, and 8½ years respectively, and in good health. I lost my fifth case with femoral thrombosis eight days postoperatively, which immediately gave me a hospital mortality of 20 per cent, reduced subsequently to 5.2 per cent on this formidable type of operation.

However, in my last fifty consecutive radical resections of the rectum and rectosigmoid for malignancy, six different plans or types of operation were employed. There were 19 one-stage combined abdomino-perineal operations with abdominal colostomy; 14 one-stage combined abdomino-coccygeal, sliding colon to (1) anus or (2) perineal outlet. There were 4 one-stage posterior resections or amputation perineal colostomies; 2 extensive mobilizations and Mikulicz (abdominal) removals of the rectosigmoid, with subsequent closure of the Mikulicz; 7 two-stage with single barrel abdominal colostomies with subsequent removal of malignancy and all gut distal to the colostomy; 4 loop colostomies followed by posterior resection, leaving the blind end of the sigmoid. This latter two-stage is safer but ultimately less satisfactory than the other operations. There were 2 hospital deaths in the consecutive fifty resections, both being pneumonias 8 and 9 days respectively postoperatively. There were 46 consecutive resections without a mortality. Thirty-nine cases were one-stage removals.

Preoperative radiation has been given in only a few of the cases. The disadvantages of the delay entailed are to be balanced against the advantages to be hoped for. We have been discouraged by finding peritoneal metastasis in several cases when they came to laparot-

omy after the six to eight-week delay incident to preoperative radiation. Delay from other causes of course is just as bad. Incidentally a thoroughly radiated case appeared to be a surface cure but the mesorectum starting immediately under the rectal mucous membrane showed a large area of hard cancerous tissue. This may be the situation in a few of the clinical cures that are being reported by fulguration of rectal cancer in various stages.

Several things can make apparent variations in operability rates. The rate would be higher for a surgeon doing only hospital practice and might be lowered considerably for one getting passing dispensary or office calls from a number of drifters or patients carried in by relatives just to ask about advanced complaints.

There is a high hospital mortality in the patients selected only for colostomy. This is 15 per cent of all colostomy operations performed or 43 per cent of those able to be given only colostomy without subsequent resection.

Better preoperative preparation, anesthesia, suitable operation, supportive measures and attention to detail are giving better results in cancer surgery of the lower bowel.

Several operations should be available for cancer of the rectum, depending upon the condition of the patient and the location and extent of his cancer.

Dr. Curtice Rosser, Dallas, Tex.—There has been a good deal of discussion of the type of operation for rectal cancer. I believe this symposium has demonstrated to us that the present very definite trend is to establish the one-stage radical procedure as the operation of choice, as the operation which should be done unless there is some definite, specific, individual contraindication.

Contraindications which have been mentioned are: an obstruction which cannot be decompressed by medical measures; a general debility on the part of the patient; and probably third and most important, a lack of experience or a lack of proper volume on the part of the surgeon.

I thoroughly agree with Dr. Graham that I would prefer the occasional operator to do a two-stage or three-stage perineal resection upon me rather than to take a textbook, or a series of textbook drawings, and make me the only patient for that year upon whom he performed a radical one-stage operation.

A parallel to which I should like to call your attention is the experience which the urologists went through in surgery of the prostate. You can recall when resection of the prostate was always preceded by a surgical suprapubic drainage of the bladder. Later the urologists found that by taking a sufficient length of time, the bladder and kidneys could be decompressed by catheter and suprapubic drainage was practically abandoned.

Apparently that is the trend in resection of the rectum. That means, of course, that if we are going to do one-stage procedures, we must follow the experience of the urologist and take a proper length of time for the decompression of the patient before this tremendously aggressive surgical maneuver is contemplated.

Dr. Graham has, in addition to stressing the essential diagnostic points concerning cancer of the rectum and sigmoid, approached this subject from a unique, humane and philosophic standpoint. When we stop to think of it, the patient with cancer of the rectum or rectosigmoid faces a cataclysm in his life. It is not only essential that he be carried through the surgical procedure, but also that he be then rehabilitated and returned to society with a sound mind and a sound body.

On reading Dr. Graham's paper and hearing his presentation today, I was impressed with the fact that he is treating this subject from the standpoint of the art in surgery as well as the science. His careful mental build-up of the patients ahead of time, and the care with which he instructs us to follow these patients mentally as well as physically afterwards are worthy of emulation.

I do not believe that we can take any one definite universal stand as to what shall be said to the patient concerning his condition. I had a recent opportunity to discuss this subject with a well-known psychiatrist and he summed it up in this way. He said, "No matter what you do, do not let your frankness take away hope from the patient. A very intelligent patient who, you believe has an excellent chance to recover from the operation and be free from cancer afterwards, can be told that he has a malignant tumor, that he has to cooperate with you in this procedure, doing his part, and that you have every feeling that he will get well, and, if you have that feeling, he will sense it in you and it gives him enough hope to carry him through. If you have some doubt in your mind, you can not talk to the next patient in exactly the same way."

Apparently the human mind is so elastic that if you leave the patient some hope, then you can deal with him with a good deal of frankness. On the other hand, it seems to me each case must be handled individually from the mental standpoint as well as from the technical, surgical standpoint.

As to the use of the intravenous drip during the time of operation, we found for the past two years that this is a much more effectual stimulant when you are using spinal anesthesia than any chemical; the use of colibacterin has proven from our experience to be a valuable additional safeguard; prolonged spinal anesthesia has made it unnecessary to change anesthetics in the middle of an operation.

More and more there is a feeling among intestinal surgeons that palliative resection of rectal tumors is justified, that a patient with a few nodules in the liver may properly have the primary growth removed to prevent the distressing sequelae subsequent to leaving such a growth in place.

That can be done honestly only if, due to these safeguards, and due to the operator's feeling that he can bring the patient through safely, the physician does not become an executioner. The time is past when the surgeon can take out a growth and lose his patient and say, "Well, he would have died anyway; it was a cancer." More and more we are feeling that it is justifiable to take out a local growth as a purely palliative procedure even though the patient has some signs of metastasis, but the basis which justifies that feeling is that now the mortality can be reduced sufficiently by careful preparation and the safeguards mentioned to justify it.

Dr. Louis J. Hirschman, Detroit, Mich.—I should like to emphasize the importance in the routine examination of a patient suffering from carcinoma of the

rectum, of bearing in mind the fact that multiple primary carcinomas are occasionally present.

I recently had a patient under my care who had two separate primary carcinomas in the rectum. The lower one was ulcerating and had been treated by radium. The second, a polypoid growth, occurred two inches above the lower one, easily within reach of the examining finger. The physician who first examined her was satisfied with the discovery of the lower lesion and made no attempt to examine higher.

A proctologic examination should include not only instrumental exploration from anus to sigmoid but a roentgenologic study of the whole colon. In our last one hundred cases, we have seen four who had more than one primary carcinoma.

I want to say a word about the location of the colostomy. I note with considerable interest that Dr. Murdoch reports a large series of cases with perineal colostomy, and we have been using that as an alternative. I believe every patient with carcinoma, all other things being equal, should have a one-stage Miles operation, with an abdominal colostomy, and it should be placed in the midline. I use the umbilical site because it is a natural opening into the abdominal cavity.

I believe the best possible chance for permanent cure is the early one-stage operation with midline colostomy. It is difficult to convince a patient that this is the best thing for him if he has been thrown in proximity with an individual who has not been properly instructed in the care of a colostomy.

In small communities especially, everyone in town has olfactory evidence of the presence of such an individual. This makes some individuals resist the idea of an abdominal colostomy, no matter how much we explain the ease of care of a properly made colostomy.

For these people, one can offer a second choice, that is, a perineal stoma. I personally favor the Lynch operation for a perineal stoma, rather than one where an attempt to save the sphincters is made.

The excision of the pathologic tissue in the Lynch operation is just as extensive as the perineal portion of a Miles operation, and the same portion of sigmoid is used for the colostomy as in the one-stage Miles operation.

In conclusion, therefore, I would say to the patient who is prejudiced against an abdominal colostomy, that there is a second choice. Do not dismiss him without giving him the opportunity to choose for himself the location of his colostomy. Remember, patients are people, and an individual has a right to choose his colostomy site. He should understand, however, that in many cases, it is the second choice, and by all means, he should be given the benefit of the perineal stoma rather than be dismissed with the statement, that nothing but an abdominal colostomy can relieve him.

Dr. H. I. Silvers, Atlantic City, N. J.—I want to emphasize what Dr. Hirschman spoke of, and that is the danger of multiplicity of lesions in or about the rectum or the lower portion of the alimentary tract. It would be comparatively easy to do one operation and to omit examinations that might reveal malignancies or involvements in other sections.

We have in the hospital now a woman who has been recently operated upon, in whom we did a resection of the sigmoid. A previous examination of the rectum showed two polyps, rather small in size, separated about two inches and a half, which, upon removal and section, were shown to be of the adenocarcinomatous type; so this woman apparently has, so far as we know, at least three carcinomatous invasions: the one for which she was operated upon, the carcinoma of the sigmoid, and the two carcinomas found in the rectum. If care is not exercised in making a complete examination of these patients, that which you do may at best not be satisfactory.

Emphasis has been laid upon the preoperative and postoperative care of these patients, and Dr. Graham particularly spoke of the need of their training in the care of the colostomy after operation. I wish to speak as a precautionary measure, of the use of the rectal tube in the irrigation of cases in which a colostomy has been done.

These individuals must of necessity take care of this outlet themselves. We are likely to look upon the rectal tube as a very simple implement, but, unfortunately, in my experience there have been two perforations of the intestine by its use. The first was by an individual who had had a resection for carcinoma of his rectum five years previously, so that he had the experience of five years in irrigating the colostomy, yet, due to his hurrying one morning, with the introduction of the rectal tube, using a moderate-sized rectal tube, he had a severe pain. He waited for a little while and then proceeded to give himself an irrigation and succeeded in running one pint of water into his peritoneal cavity.

The second one was a case in which the carcinoma was low down in the rectum and we succeeded in putting a rectal tube through the growth for the purpose of decompression. While that rectal tube was in place, the nurse inadvertently pushed on the tube causing a perforation of the bowel above the growth. I want to leave with you the thought that the use of the rectal tube is not the simple procedure we sometimes look upon it as being.

Dr. G. S. Hanes, Louisville, Ky.—I wish to take this opportunity to mention briefly my limited experience in the treatment of carcinoma of the rectum with dry ice. Having treated fibrous strictures of the rectum successfully with carbon dioxide snow, I felt that dry ice would be a much more effective means of applying cold and have, therefore, experimented upon a few patients with cancer of the rectum by employing this method.

These patients refused operation or the disease had advanced so far that no hope for relief could have been offered by surgical means. One of these patients had been in the City Hospital. The entire rectovaginal wall had been destroyed by the cancerous growth. She refused any kind of an operation and after she had returned to her home a friend of hers asked me to see her. I have treated her for twenty months with dry ice. The tumefaction, or the growth, has been largely reduced. The rectovaginal walls are now rather smooth but very firm from the deposit of fibrous tissue. During this time the patient has been given various blood tonics and proper agents to keep the bowels in as good condition as possible. She has, during the entire time, been a hearty eater which has been a great factor in keeping her general condition built up: I shall give

further snow treatments to this patient for some time. I will await developments. This method is, of course, in its early experimental stage. If there is any success to be obtained by it, it will undoubtedly have to be worked out by slow investigations.

A man who had a growth that involved the entire rectum and lower sigmoid had metastases involving the bony structures. He was given a few treatments with no beneficial results.

Another patient with involvement of the entire rectum who had been ill for more than two years and had a red blood count of less than two million was given only two treatments. He died within five weeks.

A lady, who is very frail, has a typical cancerous growth involving the middle portion of the rectum. It blocked the rectum almost completely when she was first examined. She has had several treatments and now a Kelly proctoscope can easily be introduced through the rectal stricture. The fibrous deposits in the rectal wall have now disappeared to a great extent. This patient eats very poorly and it is difficult to keep her blood built up.

The patient who has kindly consented to appear before you this afternoon had a rectal tumor about the size of a small walnut in the sigmoid. A biopsy was made and the specimen was examined here and in Baltimore. The verdict was a malignant tumor. The patient was given dry ice treatments, two of them very extensive. At the present time the tumefaction has all disappeared. It may be that this was not a malignant tumor because we were advised by the pathologist to watch the patient for a recurrence. Only time will tell the story. You can see how well the patient looks today. She appears to be in good physical condition and we hope her troubles are permanently relieved.

In my early professional career I did a number of operations for cancer of the rectum; the first one was a Kraske. Dr. Sherrill assisted me in the operation. The patient lived twenty-one years and died from other causes.

When one decides upon a radical departure from any method or accepted plan of treatment he is certainly exposing himself to more or less severe criticism. If he is sincere and feels that there is something he can reveal by persistent effort then he is justified in continuing his investigations regardless of criticism and that is what I am doing.

Dr. Hayes (closing).—I was glad to hear Dr. Murdoch mention his mortalities with palliative colostomies. I understood him to say it was 43 per cent, and I think it coincides with that of most men in this type of colostomy.

I was sorry that no one discussed or mentioned cases of endometriosis. I do not want to see any more myself. They make a very difficult situation.

Dr. Hirschman spoke of the matter of informing patients of their true condition. We must remember that we have some hard-headed folks who have got to be told absolutely that they have a cancer or a malignancy before they will have anything done for themselves.

I am glad Dr. Silvers mentioned the use of rectal tubes and catheters in colostomies. I cannot be certain but I feel fairly sure I lost a case this year from an accident of that kind. In all of our private cases and in most of our charity cases, Dr. Burr or I give the enemas for the first few days until the stoma is easily seen. You sometimes have trouble telling exactly where the opening is if you have a stoma level with the abdominal wall.

In the case which we lost this year, the house man gave the enema about the fifth day and I think he slipped the catheter down the side of the bowel and slipped it in between the leaves of the mesentery. The man died and postmortem showed he had an abscess over the promontory.

Dr. Stone told me last year of two cases he had seen, one like that mentioned by Dr. Silvers, the patient who had had a colostomy for five or six years. This was a rather nervous, irritable type of person and he started to give himself an enema one morning. The tube did not go in readily and he jammed it a little hard. It went into the abdomen and he put some water in the abdomen. Dr. Stone operated upon him and saved him.

Dr. Graham (closing).—I should like to clarify my statements in regard to what to tell the patient with cancer of the rectum. I do tell some patients who have cancer the true nature of their disability but my experience with hundreds who were not told in contrast with probably a score who were told has convinced me that most patients should not be told outright that they have a malignant condition. Just recently a patient upon whom I had performed an abdominoperineal resection, who had been previously told by his physician that he had a cancer of the rectum, made this statement to me on the second anniversary of his operation: "I feel you have done a fine operation and most of the time I feel as if I will probably obtain a cure. However, I talked recently with another of your patients who underwent the same operation about the time I did. He was of the impression that a stricture of the rectum necessitated resection and said, 'Thank God I didn't have a cancer; I would have given up had this been the case'."

"I wish," said the patient who knew he had a cancer of the rectum, "I had been told the same thing."

Dr. Silvers' comments were most important. I instruct assistants not to advance a catheter or rectal tube into the rectum a distance of more than two inches; in fact we make a line on the tube beyond which it is not to be passed upward. If a rectal tube is passed higher it may, as Dr. Silvers has stated, penetrate the bowel; in most instances it will curl up. I have demonstrated this to nurses and orderlies with the aid of the fluoroscope and a barium enema. At the same time they have observed that the term "high enema" is a misnomer.

PROTRACTED ROENTGEN THERAPY OF MALIGNANCIES*

PARTICULARLY OF THE HEAD AND FACE

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and
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The earliest high-voltage roentgen therapy of malignant growths was given by what is now known as the massive dose method. This consisted of the administration in as short a time as possible of as large a dose of roentgen rays as the patient could tolerate. Except in the treatment of superficial and localized malignant lesions, this method has now largely been abandoned and replaced by what is known as the protracted fractional dose method of treatment. This method is particularly applicable to tumors and growths about the head and neck, such as those of the mouth, tonsil, pharynx, and larynx.

The fundamentals of the protracted fractional method of roentgen therapy were first applied clinically by Coutard and used in treatment of carcinomata of the tonsil and larynx. These fundamentals include a high voltage, heavy filtration, a low intensity of administration, long single exposures, a long treatment time, and a large total dosage. There are perhaps few radiologists in this country who follow in all details the method advocated by Coutard. It is probable that there are numerous modifications, possibly as many modifications in some particulars as there are practicing roentgenologists attempting this form of therapy.

The major modifications may all be included in two groups: (1) changes in the filtration, and (2) changes in the rate of administration. The variations in filtration probably are minor and not of much importance, for heavy filters of one kind or another are always used. Probably there are but few roentgenologists who use the low intensity and long treatments as originally suggested by Coutard. Often confronted with the necessity of treating many patients in a day's time, and with apparatus capable of a much higher output, the rate of administration often is much higher than originally advocated.

The field of usefulness for protracted fractional roentgen therapy is not clearly defined. There are certain lesions in the treatment of which the method is indicated. These include:

(1) Malignant tumors of the larynx, pharynx, tonsil, and tongue.

(2) Malignant tumors of the inner surface of the cheek, of the gums, and of the lower lip that are complicated by metastases to the submental or submandibular lymph nodes, or extensions to the mandible.

(3) Epidermoid or squamous-cell carcinomata of the skin of the face and neck that are extensive, that involve cartilage or bone, and that have metastasized to the regional lymph nodes.

(4) Extensive basal-cell lesions and some tumors of the salivary glands.

The technical factors most often used are a voltage of 200 to 220 kilovolts, a milliamperage of 5 to 25, a distance of 50 to 70 cm., filtration from 0.75 to 2.0 mm. copper and 1.0 to 2.0 mm. aluminum, and a daily dose of 200 to 250 roentgen units measured in air. Often substituted for the pure copper filter is a composite filter of 0.44 mm. tin, plus 0.25 mm. copper, plus 1.0 mm. aluminum as recommended by Thoraeus. This filter has the advantage of delivering a beam of rays equivalent in quality to more than 2.0 mm. of copper, but at a greater intensity, thus shortening the treatment time.

Perhaps the most important part of protracted treatment is the total dosage that can be administered. By giving daily doses of 200 to 250 roentgen units and by continuing the treatment period for three to four weeks, a total dosage of 4,000 to 6,000 units can be given. By using more than one portal in the treatments and by prolonging the series to six or eight weeks, doses totaling 8,000 or more units can be administered. The protraction of treatments over such a long period is time-consuming, tiresome, and expensive, but the improved results are due more to this protraction than to any other factor.

As would be expected from this heavy irradiation, all of the patients experience more or less severe reactions, sometimes so severe as to necessitate stopping the treatments. The earliest reactions that are noted are those of a swelling of the salivary glands if they should be in the irradiated field. This may be seen after the first treatment. Usually it subsides in a few hours, but it may occur again after the second treatment or later. There may be a swelling of the subcutaneous tissues. Although this may

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become chronic, producing a definite edema of the skin, usually it does not persist.

If any of the mucous membrane of the mouth is included in the irradiated fields, there occurs a dryness of the mouth, a loss of the sense of taste, a peculiar thickening of the secretions of the salivary glands and mouth, and a difficulty in swallowing. This is followed at a definite time in the series of treatments by a decided reaction in the mucous membrane of the mouth. This has been called a radio-epithelitis by Coutard, who says that it always begins on the thirteenth or fourteenth day. It is characterized by the appearance of a thick, tenacious, bluish-white, false membrane on the mucosa in the irradiated field. Coutard attributes this reaction to a destruction of the germinal cells of the epithelium of the mucous membrane. The reaction has a definite duration. It lasts usually about two weeks and then subsides, the mucosa returning to normal in appearance.

Sometimes an early erythema occurs in the skin. This accompanies the early edema and progresses with it. Later, a much more serious reaction, called a radio-epidermitis, becomes manifest. This is characterized by destruction of the superficial layers of the skin with blistering, edema, slipping of the epidermis, and weeping. This usually occurs at the beginning of the fourth week after the institution of the treatments, but it may occur after the treatments have been completed. It lasts for about two weeks; in another two-week period repair takes place from the surrounding skin and from islands of epidermal cells in the denuded areas. There may be permanent skin damage with scarring, depigmentation, and telangiectasia.

These local reactions in the skin and mouth are accompanied by more or less general reaction. Loss of appetite, general malaise, occasionally nausea and vomiting, loss of weight, and general debility sometimes are very troublesome. Sometimes the dryness of the mouth, the loss of taste, and the chronic edemas persist for a long time. There have been changes noted in the muscles; and in a few instances late necrosis of the mandible, the maxilla, and the cartilage of the larynx have occurred.

As can be imagined, radiation therapy of this kind is not easy to take nor easy to give. The general and local reactions may be so severe that the patients object seriously to continuing them. It requires the greatest of tact and persuasion to induce the patient to continue, and the best of nursing care to keep them passably comfortable. Occasionally, because of unusual debilitation of the patient or unusually severe reactions, it is even necessary to discontinue the treatments before a calculated dosage has been administered, and once in a while a patient refuses to take further treatments.

Table 1 gives a summary of the patients treated by this method. Unless inside the mouth, pharynx or larynx, local lesions were not treated by protracted radiation. The table shows 9 patients with carcinoma of the lip. All of these had metastases to the submental or submandibular lymph nodes or extensions to the chin or the mandible. Twenty patients had extensive cancers of the skin, all of them involving the deeper structures or the regional lymphatics; 3 of these were large basal-cell lesions, and the others were epidermoid carcinomata. Eight of the patients had squamous-cell carcinomata of the tissues over the alveolar processes of the mandible. There were 5 patients with extrinsic carcinomata of the larynx. The remainder included those of the tonsil, the salivary glands, the tongue, the pharynx, the nasal cavity, and the axilla.

The results show that 32 of the patients have died. Twenty-nine of these deaths were due to the original diseases. Three are reported as having died of other causes and as being cancer-

Region	No. Pts.	Dead	Not Traced	Living	Cancer-free	Cancer Present
Gum	8	2	1	5	3	2
Cheek	6	5*		1	1	
Skin	20	10*	1	9	7	2
Lip	9	4	2	3	2	1
Larynx	5	3		2	2	
Tongue	2	1		1	1	
Tonsil	2	2*				
Pharynx	2	1		1	1	
Salivary gland	3			3	3	
Axilla	3	3				
Nasal cavity	1	1				
	61	32	4	25	20	5

*In each of these groups one patient lived without local recurrence from two to more than four years and is reported to have died from some other cause. These 3 added to the 20 that are living without sign of cancer would give 23 probably successfully treated, or 37.7 per cent.

Table 1

free at the time of death. Twenty-five of the patients are living; 20 of these are apparently cancer-free, and 5 of them probably still have some of their cancer remaining. Of the total number, the treatments have thus far been satisfactory in 23, or a percentage of about 37.7. Patients have not been considered who have been treated in the last year, and the 4 patients not traced are included in the unsatisfactory group.

It would be interesting if we could discuss this group of patients in detail. Some of them had had operative treatment before they were referred for x-rays, and the lesions were postoperative recurrences. Others were operated upon at the time of the treatments. The operative treatment may have been the deciding curative factor in the three tumors of the salivary glands. Some of the patients had had radium treatments. This was true of some of the lip tumors, but at least two had x-ray treatments to the primary lip lesions. For one of these the responsibility for treatment was ours, and the regional lymphatics were treated ineffectually by the older method of high voltage therapy. In the treatment of a few of these patients radium was used with x-rays and was considered to be a valuable adjunct.

Some of the cases may be briefly summarized:

Case 1.—Carcinoma of the right alveolar margin with invasion of the mandible. Treated May, 1939; tin-copper-aluminum filter, 6000 r.; had other treatments elsewhere. Patient is living, but probably is not cancer-free at this time.

Case 2.—Carcinoma of the right gum with invasion of the mandible. Treated April, 1939; tin-copper-aluminum filter, 3600 r. Treated again August, 1939; tin-copper-aluminum filter, 6000 r. Patient is living, but probably not cancer-free.

Case 3.—Carcinoma of the right gum spreading onto cheek and anterior pillar of fauces. Treated May, 1937; 0.75 cu. filter, 6000 r. to one area. Patient living and apparently cancer-free.

Case 4.—Operative recurrence of carcinoma of the left side of the mandible. Treated December, 1938; tin-copper-aluminum filter, 5000 r. Patient living and apparently cancer-free.

Case 5.—Left side gum, extending to alveolar process and lip and tongue. Treated September, 1938; Thoraeus filter, 5000 r. to one area. Patient apparently well without sign of recurrence.

Case 6.—Extensive carcinoma of lower lip involving the submental nodes and skin of the chin. Treated June, 1938; tin-copper-aluminum filter, 5150 r. Local recurrence treated February, 1939. Reconstruction operation in June, 1940; scar excised; microscopic examination negative for carcinoma.

Case 7.—Carcinoma of the cheek extending through to the outside. Treated March, 1936; 1 mm. cu. filter, 3500 r. and radium needles for 240 mg. hr. Lived four years and five months and was reported to have died of other causes.

Case 8.—Localized carcinoma of the cheek. Treated December, 1937; 1 mm. cu., 2912 r. and local application of radium. Living and apparently cancer-free.

Case 9.—Wart-like growth on the nose that had been treated with a paste, after which the end of the nose had come off. Biopsy showed squamous carcinoma. Treated April, 1939; tin-copper-aluminum filter, 6000 r. Living without recurrence to date.

Case 10.—Carcinoma of the epiglottis. The epiglottis was removed; radium seeds were introduced. Treated August, 1938, with x-ray; tin-copper-aluminum filter, 4000 r. units. Living without signs of recurrence.

Case 11.—Extensive extrinsic carcinoma of the larynx. Treated July, 1938; tin-copper-aluminum filter, three areas; total 6600 r. units. Living without signs of recurrence.

Case 12.—Carcinoma of the larynx above the vocal cords. Treated February, 1939; tin-copper-aluminum filter, three areas, 8200 r. units. Lived eight months and died of a recurrence.

CONCLUSIONS

Protracted fractional roentgen therapy may be used in malignant tumors about the head and neck whenever other methods of treatment are not applicable. It is time-consuming, tedious, and expensive; and it often is accompanied by severe and troublesome reactions. In the series reported, sometimes combined with other forms of treatment, this form of therapy has been successful to date in relieving 23 of 61 patients, or 37.7 per cent.

DISCUSSION (*Abstract*)

Dr. Ira H. Lockwood, Kansas City, Mo.—The majority of the small cancerous lesions of the skin of the head and face respond quite well to doses of low voltage, lightly filtered radiation. The smaller the area involved the more intensively one can treat these lesions. The large ulcerating neoplasms are best treated by higher voltage roentgen rays with considerable filtration and by the protracted dosage method.

Cancer of the lip and of the tongue is best treated by interstitial irradiation when this is possible, and in general this statement holds true for all intra-oral malignancies. When such treatment cannot be carried out, the use of roentgen irradiation applied by means of intra-oral cones is of definite value.

Malignancies of the nasal accessory sinuses and nasopharynx may be carcinoma, lymphosarcoma, or osteosarcoma and are highly malignant. Approach is difficult, making surgery of limited value except in establishing drainage and securing tissue for diagnosis. Irradiation therapy in these cases, either external or interstitial in type, will usually produce definite palliative effects and

in some cases actual cure. Strictly speaking, malignancies of the larynx and hypopharynx belong to the realm of the neck. Treatment is generally restricted to irradiation. In the case of laryngeal carcinoma protracted therapy with high voltage, heavily filtered, has become the treatment of choice. The only exception is possibly in extremely early cases of minimal intrinsic lesions. Here surgery is capable of completely eradicating the neoplasm.

Pfahler uses a combined method of radium and x-ray which he believes permits prolonged irradiation with better results. Coutard points out that undifferentiated forms of cancer vanish rapidly, whereas differentiated require a longer time for disappearance, but the dose that causes the disappearance of either form is approximately the same. Coutard also points out that one factor in successful radiation of laryngeal cancer is a daily and regular reduction in the size of the portal used.

Hayes Martin also believes that effective treatment for cancer of the larynx and the pharynx depends in some measure on the size, number and location of the portals. Skin reaction is of little or no value in determining the general body reaction.

What to do with a metastatic lymph node has long been a moot question. Duffy feels that the most successful treatment is radical excision when the node is freely movable.

Hayes Martin advises daily intensive doses with small portals to the local lesion and neck nodes, and at the end of three weeks one can decide whether to proceed to skin tolerance or withhold external irradiation and use interstitial radiation as a supplementary procedure.

Charles Martin has had excellent results using weak platinum needles embedded in and about the nodes and heavily filtered, high voltage external radiation. Apparently the best results are obtained when there is considerable surrounding tissue reaction about the nodes.

One might mention mixed tumors of the parotid gland, which make up about 90 per cent of salivary gland tumors. Treatment by high voltage roentgen irradiation or by radium irradiation or both is generally indicated and is found to be of definite value. Even in the acute suppurative type excellent results have been obtained.

Dr. D. Y. Keith, Louisville, Ky.—I should like to emphasize what Dr. Rhinehart has said in regard to the mixed type of radiation. I know in intra-oral carcinoma we have had more complete relief with no recurrences in cases in which we have used both radium and x-ray. We are using higher filtration and higher voltage than the doctor referred to in his paper, namely, 400,000 volts and 6.5 mm. of copper.

In intra-oral malignancies, we have had some with involvement of both alveolar processes on one side, with involvement of the cheek, that have entirely cleared up and have remained clear under high voltage with high filtration. We mean by that a voltage of 400,000 and a filtration equivalent to 6.5 mm. of copper at a distance of 70 cm.

Dr. D. A. Rhinehart (closing).—We do not have available a 400 kilovolt equipment like Dr. Keith; nor have we the low-intensity radium needles advocated by Dr. Martin. Whenever it appears advisable, we do use interstitial radium treatment as an adjunct to the x-rays. For example, two of five patients with carcinoma of the larynx have been cancer-free for over three years. One of these was a carcinoma of the epiglottis that was treated with x-rays plus the implantation of radon seeds. The other patient was treated with x-rays alone, for radium could not be used.

To minimize the skin and mucous membrane reactions we follow, of course, the method suggested by Dr. Lockwood, of using larger portals in the beginning of the treatments, then reducing the size of the portals. This has to be done with great care. In a few instances we have reduced the size of the portals too much, for there have been recurrences outside the irradiated areas.

Protracted fractional roentgen therapy in advanced malignancies about the head, the face, and the neck is a severe form of therapy. It is hard for the patients to endure and it is hard for the therapist to administer.

VESICAL DYSFUNCTION FROM LESIONS OF THE CAUDA EQUINA*

THE PHYSIOLOGY OF MICTURITION

By LLOYD G. LEWIS, M.D.
Baltimore, Maryland

The urinary bladder has two functions: storage and evacuation of urine. Urine may be normally retained at pressures under 10 mm. of mercury up to the physical capacity of the bladder. The desire to urinate is felt when the intravesical pressure exceeds 10 mm. of mercury regardless of volume. In the infant, voiding is automatic. Later, conditioned reflexes are developed which allow the child to retain urine beyond the point of first desire. The intravesical pressure may be lowered voluntarily by inhibition from the cerebrospinal nervous system. When circumstances permit, the intravesical pressure may be voluntarily raised so that voiding follows automatically. The detrusor contracts as a whole. At first the dome of the bladder is narrowed, the base widened. The pressure is maintained in excess of 40 mm. of mercury during the entire act of urination. Contraction of the abdominal and perineal musculature is not essential to, but may assist in initiation of the voiding act.

The detrusor or large muscle of the bladder wall is derived from the cloacal membrane. Its motor innervation is mainly parasympathetic.

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*From the James Buchanan Brady Urological Institute, Johns Hopkins Hospital, Baltimore.

Sensation of vesical distention is recorded by nerve endings on the muscle bundles, through nerves which pass by way of the second, third and fourth dorsal sacral roots. Sensations of pain, and temperature, on the other hand, are relayed through nerves which accompany the sympathetic system to the thoracico-lumbar segment. Activity of the detrusor is controlled by local neuromuscular mechanism and by reflex arcs connecting the spinal cord and brain.

Within the bladder lies the vesical trigon, developed from mesoderm. The trigon with Bell's muscles is innervated by the sympathetic nervous system.

The early German anatomists, Henle, Kohlrausch and Rosenthal, and later Wesson, described the muscles that surround the vesical orifice, generally known as the "internal sphincter," as an orderly arrangement of detrusor fibers. They do not form a true sphincter. The arrangement of these muscle fibers is such that urine may be retained in the bladder at the vesical orifice. When the detrusor contracts forcibly, as in normal voiding, the longitudinal fibers which pass through and around the orifice internally open the neck of the bladder by overcoming the lesser pull of the circular fibers, which are arranged in opposition. Young says that the trigon opens the neck of the bladder for the passage of urine. We believe that the trigon plays a part in opening the vesical orifice, especially when the orifice is obstructed by the median enlargement of the prostate. The trigon, by virtue of its shape and position, is adapted to this function; by its contraction the floor of the orifice is depressed and the base is widened. The detrusor and the trigon are antagonistically innervated; therefore, it seems improbable that this combined effort is controlled by the central nervous system. However, it is possible for the trigonal muscle to be drawn backward and stimulated directly by the powerfully contracting detrusor. When there is no pathologic obstruction at the vesical orifice, trigonal action is not necessary for efficient voiding.

In addition to the resistance of the musculature at the vesical orifice, closure of the urethra is maintained by the tonicity of the external sphincter, a striated muscle innervated by the somatic pudendal nerves. During micturition the external sphincter is reflexly relaxed. The flow of urine may be interrupted by voluntary contraction of the external sphincter.

The sympathetic nerves have been called the filling nerves of the bladder, the parasympathetics the emptying nerves. There is no proof that the detrusor is inhibited by sympathetic stimulation. When the sympathetic nerves (the presacral nerves) have been cut for relief of bladder pain, micturition remains normal. The "internal sphincter" has been accorded innervation by the sympathetic system. We feel that there is no proof of this. We fail to see why detrusor muscle fibers should change their innervation merely because of their orderly arrangement around the vesical orifice.

Coordinated reflexes exist between the detrusor and the external sphincter. Normal micturition depends upon the continuity of reflex arcs between the detrusor, spinal cord, and brain. Efficient bladder function depends upon perception and reflex reaction to changes of intravesical pressure.

Lesions of the cauda equina may bring about profound vesical dysfunction by interruption of reflex arcs relatively close to the bladder. When the sensory side of the arc is alone involved, the tabetic type of lesion ensues. The patient does not know when his bladder is full. He may, and usually does, allow excessive filling, which brings about atony of the detrusor from unrelieved pressure. Infection of the urine is usual because of the presence of a large residuum. When the motor nerves are intact the patient may voluntarily empty the bladder, but secondary atrophy makes this ultimately impossible. There may be overflow incontinence. When there is concomitant loss of urethral resistance through loss of somatic innervation to the voluntary sphincter, voiding may be quite efficient, but a residuum remains. These patients may be incontinent. Treatment of the tabetic type of cauda equina lesion is illustrated in the following case reports:

Mrs. L. S., 35 years old, married, sought urologic attention because of incontinence of urine, which began nine years before, during the early stages of pregnancy. The patient had fallen downstairs, had had some back pain, but did not consult a physician immediately. Later her difficulty in controlling her urine was ascribed to pregnancy. She was delivered of a full-term child by high forceps. Incontinence persisted. She had to wear pads constantly. Some time later she consulted a gynecologist, who made a diagnosis of cystocele and rectocele and proposed an operation for these conditions, which was refused. Several weeks before I saw her the patient sat on a hot radiator, did not realize it, but she suffered a second degree burn of the buttocks. For nine years the patient had had more or less constant dribbling of urine day and night.

Physical examination revealed no abnormality unrelated to the present illness. There were scars on the

buttocks of the healed second degree burn. There was complete saddle anesthesia. There was a mass in the abdomen extending up as high as the umbilicus. The external genitalia showed relaxation of the outlet. There was a deep perineal tear. There was a definite rectocele. There was absolute relaxation of the anal sphincter.

There were 2,000 c. c. of residual urine. X-rays of the lumbar spine and pelvis in the anterior posterior film showed no abnormality, but in the lateral film there was dislocation of the fifth lumbar vertebra forward on the sacrum. An orthopedic consultant advised a spinal brace, which relieved the patient's back pain.

After the patient's bladder had been emptied of residual urine she was given 0.1 gram of beta-methyl-acetyl-choline chloride* four times a day. Thirty minutes after taking this acetocholine derivative by mouth the patient was ordered to urinate voluntarily, which she was able to do by assisting with manual abdominal pressure. She was very much surprised to find that she had no incontinence as long as she was able to empty her bladder this way. She took the acetylcholine product for about two weeks, then found that she could urinate without the drug. On one occasion, when she delayed emptying her bladder every four hours by clocked urination, she went into urinary retention, followed by overflow incontinence. This condition was corrected by resuming the use of the drug and clocked urination. For the last three years she has had no incontinence, no difficulty of urination as long as she urinates about every four hours. She has visited my office upon several occasions and I have found no residual urine.

C. R., 12 years of age, was referred for urologic consultation because of incontinence of urine and feces since birth. This boy did not wet the bed regularly and by getting up at midnight and again at 4:00 o'clock in the morning his bed could be kept dry. When he sat in a chair there was no leakage of urine, but as soon as he got on his feet there was dribbling. There was never any burning on urination, never any pain. He had never had the normal sensation of desire to urinate.

The patient was well developed for 12 years. There was no difficulty of locomotion, no deformity of the extremities. The kidneys were normal. The bladder was not readily palpable. There was excoriation of the skin of the external genitalia from incontinence. Puberty had just been reached. There was absolute loss of anal sphincter tone. The perineal muscles were definitely weak. The patient voided 75 c. c. of urine, which was uninfected. Catheterization revealed 325 c. c. of residual urine. During the passage of the catheter it was noted there was loss of external sphincter tone.

Cystometric study is shown in the lantern slide. Fifty c. c. increments of fluid were readily accommodated up to the capacity of 300 c. c. on pressures under 10 mm. of mercury. After the increments between 300 and 500 c. c. the pressure rose rapidly to 15-20-25 and then 30 mm. There was no voiding reflex. The patient had no desire to urinate. On straining he was able to raise the pressure to 38 mm. There was no leakage around the catheter. Cystogram showed relaxation of the vesical orifice. In view of the anatomy of the bladder and vesical orifice, this is interpreted as showing lack of detrusor tonus.

*Mecholyl, Merck & Co., Inc.

This is a typical picture of the tabetic type of bladder. In addition there was loss of sphincter tone. The patient had been referred to me because his physician had read of Gracilis' transplantation in certain cases of spina bifida with loss of sphincter tone. Since the patient was unable to empty his bladder without sphincteric resistance, I did not think that the operation was indicated. After three months of clocked urination with intermittent use of beta-methyl-acetyl-choline chloride the patient is little if at all improved. Dees has shown that cats with experimental tabes do empty their bladders after presacral neurectomy. One hesitates to advise presacral neurectomy in a boy of 12 because of probable sterility. I recommended the operation to the family with this reservation and the operation has been refused. At the present time the family physician is carrying out dilatation of the urethra, emptying the bladder by catheterization every three days in the hope that we can increase the patient's detrusor tone. I think the outlook is hopeful.

Pure lesions of the lower motor neurons are hard to distinguish from purely sensory lesions because of the difficulty which these patients have in differentiating the sensation of vesical distention from discomfort of an over-distended bladder. They may have never experienced the normal desire to urinate. The following report may illustrate such a case:

G. B., 19 years old, was referred to Dr. Hugh Young October 31, 1933, because of incontinence, particularly at night. In March, 1932, the patient fell into a forty-five-foot well, striking on his buttocks. He did not urinate for twenty hours after the accident, when he was catheterized. For the first twenty-four hours there was terrific pain in the legs, followed by loss of motion of both legs and loss of sensation to the level of the umbilicus. Laminectomy was carried out. Bone fragments which pressed on the spinal cord from the first to the third lumbar vertebrae were removed. Five days later the operative wound was opened and more clot removed with another bone fragment. Because of irritation of the retention catheter perineal urethrotomy was carried out. Drainage was kept up for ten months. There was no history of acute upper urinary tract infection. At the end of that period the patient was able to urinate, but noted that he had to strain. He had regained power of locomotion and skin sensitivity returned.

In September, 1933, the bladder became distended and he went into retention. The bladder was drained for a week. The patient was taught to catheterize himself and did so once a day. Bowel evacuation was difficult.

General physical examination was negative, except for loss of patellar and Achilles tendon reflexes. Cystoscopy revealed 100 c. c. of residual urine and a bladder capacity of 400 c. c. Dr. Young noted that the

trigon was flatter than normal. There was no relaxation of the vesical orifice. The anal sphincter tone was poor, but the patient could contract the anal musculature as well as the perineal musculature.

Using a crude cystometer, we found that the bladder sensation was not lost. There was, however, definite weakness of the detrusor.

Intravenous pyelograms revealed a normal upper urinary tract. A cystogram showed relaxation of the vesical orifice.

On November 15, 1933, Dr. Young carried out presacral neurectomy. On the day following operation the patient was catheterized twice, and 500 and later 300 c. c. of urine were obtained. Two weeks after operation the patient could urinate with great difficulty, using manual as well as abdominal muscle assistance.

The patient returned for examination January 23, 1934, saying that he was greatly improved. The voiding pressure had increased. The patient felt that he was able to empty his bladder completely. Because of straining, some fecal matter was evacuated during micturition. He had catheterized himself and regularly found from one to two ounces of residual urine. He had been continent at night. By March, 1934, the patient was voiding much better and had no residual urine. The sensation of bladder fullness appeared to be quite normal.

We have observed this patient regularly since 1934. He has had dilatation of the vesical orifice, using the Kollmann dilator. I examined the patient July 2, 1940. For several years he had had no bed wetting. He had not had to catheterize himself. By the use of urinary antiseptics the urine had become sterile. He had had to strain considerably to urinate, but felt completely relieved.

Cystometric examinations showed a residual urine of not more than 50 c. c., and bladder capacity of 600 c. c. Increments of 50 c. c. were well accommodated. When the bladder was filled to 500 c. c. the intravesical pressure was 12 mm. At 600 c. c., it was 18 mm., with no voiding reflex. The patient had a terrific desire to urinate. By straining he could raise the pressure to 70 mm. No fluid escaped around the catheter. The normal bladder sensation would indicate that the sensory nerves are intact. This is apparently a case of injury to the lower motor neurons. The value of presacral neurectomy is questionable in this case. There is definite scar formation in the urethra. The urethra must be kept dilated in order to lessen urethral resistance.

Lesions of both motor and sensory fibers are quite common, particularly in spina bifida occulta. These children do not dribble constantly. The amount of residual urine is much less than in the tabetic type. Involuntary voiding occurs. Some patients with good voluntary sphincter control have only incontinence at night when fast asleep. Their sense of vesical distention is poor if present at all. They have great difficulty in voiding voluntarily and call upon the abdominal and perineal muscles to assist in raising their intravesical pressure. When the somatic innervation is also involved they may be totally and consistently incontinent. Since the reflex arcs may be totally interrupted, the local myoneural reflexes of the bladder wall are operating without cerebrospinal control. Contraction waves of low amplitude occur which are inefficient in evacuating the bladder.

Miss C. F., aged 30, single, in 1931 suffered from a self-inflicted wound by firing a 38 caliber bullet into the spinal cord at the level of the first lumbar vertebra. There was immediate spinal shock, with urinary retention. The patient was catheterized during her hospitalization and at intervals following. There was gross infection of the bladder urine and in 1935 a calculus was removed from the bladder suprapubically. She wore a retention catheter and the suprapubic wound healed. The patient had been on retention catheter drainage for two years. In addition to her bladder difficulty, there was paralysis of both legs. The bullet was removed.

The patient was a small, emaciated woman of 30. There was definite atrophy of both legs. The abdominal muscles were of good tone. The external genitalia were normal. Pelvic examination was negative. The first increment of 50 c. c. was well accommodated. After the second increment of 50 c. c. the patient complained of severe abdominal pain. She tried to urinate, but could not raise the intravesical pressure above 20 mm. of mercury.

The only important thing about the cystometric study was that on repeated attempts and multiple studies the patient was unable to raise the intravesical pressure above 20 mm. There was apparent loss of sensation of bladder fullness and the patient was sure that the sensation she received on stretching was pain rather than fullness. By such an injury at the level of the first lumbar vertebra the pain nerves would be intact, but the sensation of fullness would be lost.

Cystoscopy revealed acute cystitis with redness and bullous edema of the bladder mucosa. A calculus 2 cm. in diameter was seen at the base of the bladder behind the trigon. The vesical orifice was not relaxed. The calculus was crushed with a rongeur and removed.

The lesion involved both motor and sensory fibers at the conus medullaris.

By the use of a decompression apparatus I tried to stretch her bladder and succeeded in getting its capacity up to 400 c. c. Nevertheless, the patient was never able to urinate because of lack of detrusor power. She returned to Louisville, which is her home. Dr. Franklin Jelsma later operated upon her spinal cord and released adhesions around the cauda equina. The sensory nerves were cut to relieve pain in her legs. The patient wrote me after her operation that she was greatly improved. However, return of bladder function was not considered possible, since the motor and sensory fibers were both divided.

We have seen children with spina bifida who have apparently irritated bladders. They have urgency with absolutely no control of micturition. The following case report may be illustrative of an irritative lesion of the motor nerves.

E. J., 5 years old, colored, had never gained control of her urinary bladder. There had been bed wetting and frequent urination during the daytime with in-

voluntary voiding. There had never been any bowel difficulty. General physical examination was entirely negative. There was no evidence of peripheral neurologic involvement.

Cystometric studies showed a very active stretch reflex. Her bladder capacity was limited to 150 c. c. There was no residual urine.

X-rays showed a defect in the sacrum extending upward to involve the fourth and fifth lumbar vertebrae. In the absence of other neurologic involvement we must conclude that spina bifida is responsible for the bladder lesion. The only way we can explain the finding is on an irritative basis. X-ray evidence of spina bifida occulta gives us no idea of the extent of neurologic involvement.

This child was given subsaturation dosage of belladonna. Her symptoms cleared up remarkably in twenty-four hours. Cystometric studies indicated a depression of bladder activity. The child was kept on belladonna for about two weeks with absolute urinary control. When the belladonna was discontinued her difficulty returned. On small dosage of phosphate of 3-diethylamino-2, 2-dimethylpropanol tropic acid ester, "syntropan,"* a tropic acid derivative, urinary control returned. In the past two years the child's symptoms have improved. She has been given "syntropan" occasionally, but not regularly.

We have seen four other such cases improved by belladonna. The exact nature of the condition cannot be understood until pathologic evidence of the lesion is obtained.

In the evaluation of cauda equina lesions involving bladder control, several points are important.

(1) Is it an acute condition? Can neurosurgery be of help?

(2) Is voluntary sphincter control adequate? Loss of sphincter control may or may not be associated with loss of anal sphincter tone.

(3) Has the patient any sensation of bladder filling? This can be best determined by cystometric studies.

(4) How much residual urine is present on repeated determinations? There is practically always some; less in combined lesions, more in tabetic lesions.

(5) How much automatic control is present? This can only be determined by cystometry.

For tabetic lesions with good voluntary sphincter control, clocked urination, the use of acetyl choline derivatives, bladder drainage to allow contraction and restoration of muscle tone; lastly, the possibility of presacral neurectomy as a useful procedure should be considered.

In combined lesions with fair reflex action, lessening of urethral resistance by sectioning part of the nerve supply of the external sphincter or division of it may diminish residuum of urine.

When there is lack of voluntary sphincter tone one must consider the factor of relatively strong or weak detrusor activity before repairing the sphincter by plastic procedures.

Irritative lesions with very little residual urine may be benefited by atropine or tropic acid derivatives.

Lesions of the cauda equina are legion and no single routine procedure is adequate for restoration of function. Some may be better if left alone.

I wish to express my appreciation to Dr. Hugh H. Young, who permitted me to report his case, and also for his advice.

*Hoffmann-LaRoche, Inc.

DISCUSSION (*Abstract*)

Dr. D. K. Rose, St. Louis, Mo.—Cystometric studies give us a graph of individual bladder function which clinically should explain any dysuric symptoms, such as types of incontinence or inability to void. For example, incontinence may occur only when the patient is erect, or upon sudden exertion, or it may be associated with or without a warning sensation of a desire to void. On the other hand, inability to void may be due to a spastic or blocked outlet or to a diminution in expulsive force of the bladder.

Our greatest hope for cure lies in being able to correct the bladder outlet function. In our work at Washington University at this time we are greatly encouraged in this hope as it now seems probable to us that bladder contraction or dilatation reflexly follows certain stimulation to the proximal posterior urethra, which we term the "nodal area." We are able to stimulate this area by way of the urethral meatus and obtain active dilatation of the bladder wall, which, of course, is associated with a lowering of intracystic pressure. On the other hand, stimulation of this same nodal area via the internal sphincter and therefore involving trigonal muscle contraction, causes a contraction of the bladder wall.

Obviously the intermediary action is that of the internal sphincter. We have long known that action of the internal sphincter to open for expulsion or to close for retention of urine is anatomically correlated to the musculature of the bladder wall, but in our present conception, diagnostically at least, antagonistic action of

sympathetic and parasympathetic nerves can be disregarded.

To expel urine our primary afferent spinal cord impulse is from the posterior urethra, associated with a voluntary lowering of the perineum which in turn initiates a pull contraction stimulation of the trigonal muscle with opening of the internal sphincter, whereupon the bladder wall automatically contracts.

Conversely, for retention of urine, the first movement is a voluntary contraction or upward perineal pull with consequent lack of such stimulation of the nodal area associated with relaxation of the trigonal muscle and closure of the internal sphincter, whereupon the bladder wall automatically dilates.

The next consideration necessary is the pressure cystometric curve, two tracings at the same sitting, to show the status of the bladder wall stretch reflex, whether strong or weak. We speak of this as the myogenic factor.

Efforts to deal with such changes in bladder wall strength may be accomplished by hydraulic distention, clocking urination, either empty often to increase the expulsive force, or retain as long as possible to stretch the bladder wall and so decrease the expulsive force. These efforts in certain instances may be supplemented by use of a catheter, drugs, of penile clamp, or a pessary for pressure against the trigone and internal sphincter area.

The internal sphincter area and posterior urethra may be dilated or not, as indicated in its symptomatic relationship with the status of the bladder wall.

The external sphincter mechanism may be treated by a Kelly stitch, cystocele, or pelvic floor repair, muscle transplant, muscle exercise, use of Dr. Lowsley's rubber catgut, and hopefully in the future by section of a pubic or pelvic nerve. In cauda equinal lesions consideration of both the myogenic and neurogenic factors may point to a management which will afford great symptomatic relief.

Dr. Owsley Grant, Louisville, Ky.—There are one or two things that perhaps have not so much to do with cauda equina lesions as with incontinence of urine, in which we have been particularly interested.

The first one is the type of incontinence that occurs in many women whom we see in the third, fourth, or fifth decades of life, who have apparently a weakened sphincter, in whom we are unable to demonstrate by x-ray pictures disturbances in the cauda equina, or by neurologic examination any nerve lesions.

I have seen little in the literature upon the relief of distended bladder in cases which are permanently paralyzed.

Montague Boyd some years ago wrote a paper on relief of it by suprapubic drainage. We see a fair number of individuals injured in mines by slate falling upon their backs. Unfortunately we see them usually after two or three weeks or even a year, when they are completely paralyzed below the waist. Most of them have completely lost function and are confined to bed for the remainder of their lives. We have undertaken the procedure of destroying the external sphincter, believing it is a better plan to give them relief through a natural canal without the use of a catheter suprapubically or through the urethra.

We did this in the early stages by doing the thing we used to attempt to avoid in perineal prostatectomy: that is, we opened the urethra and destroyed the sphincter. Since that time we have been able to relieve several cases by using the electric current.

Dr. Nelse F. Ockerblad, Kansas City, Mo.—Careful studies of all vesical dysfunction cases have extended our knowledge of this subject so that we are now not astonished when we encounter the various lesions of the cauda equina which can occur, and there is a broad variety.

A little boy of seven years of age was sent to me because of retention of urine. Now, retention of urine in a youngster is significant enough to require careful study. It was found that he had congenital valves in the posterior urethra. In addition to that, x-ray plates showed that he had a complete absence of the sacrum. This bony anomaly, undoubtedly, caused certain lesions in the cauda equina, naturally affecting the bladder. X-rays then taken of the bowel showed an enormously dilated colon with very chronic constipation.

We are all indebted to Dr. D. K. Rose, one of the pioneers in this field, and to Dr. Lloyd G. Lewis who has followed many of the suggestions of Dr. Rose, for both of these gentlemen have contributed much to our knowledge of this obscure field.

Dr. Lewis (closing).—When automatic bladders are studied with a cystometer, one finds that as the lesion approaches the brain, leaving more spinal reflex arcs intact, a more efficient bladder results.

As a general rule in cauda equina lesions, where there is sensory and motor loss, the bladder contracts constantly approaching fibrillation, stimulated by its own myoneural mechanism; a very inefficient type of bladder.

One of my patients with a crushing injury of the twelfth thoracic vertebra has what I have called involuntary voiding. He cannot urinate voluntarily, but partially empties his bladder at intervals without sensation. He voids automatically when the intravesical pressure exceeds 12 millimeters of mercury. He has no way of stopping it because his external sphincter fails to act.

On the other hand, I have a boy of twenty-one who suffers from a lesion of the sixth cervical vertebra, who also has involuntary voiding but, fortunately, he has good external sphincter control. He can delay urination long enough to use the urinal when in bed. He is forced to wear a rubber urinal when out of the house.

I particularly want to emphasize that voiding is stimulated by increase of intravesical pressure in both the automatic as well as in cerebrally controlled bladders.

ENURESIS*

By MAY AGNESS HOPKINS, M.D.
Dallas, Texas

There is no behavior disorder in childhood which has called forth so much literature as enuresis.

Statistics show

Results of Treatment	Per Cent
Cured	53
Improved	23
No improvement	24

Statistics also show

Duration and Degree	Per Cent
Enuresis since birth	58
Began at 3½ years	32
Traced to inheritance	10
Diurnal incontinence	12

As to etiology:

(1) Bad habit

(2) Psychological
- (a) Nervousness
- (b) Masturbation
- (c) Neuromuscular fatigue

(3) Endocrine
- (a) Hypothyroidism
- (b) Hypo-antuitarism

(4) Physiologic
- (a) Irritation as worms
- (b) Overdistended bladder
- (c) Cystitis
- (d) Diet errors
- (e) Generally debilitated children

(5) Allergy

(6) Anatomical
- (a) Obstruction neck of bladder, found mostly in males
- (b) Congenital valves at urethral orifice, found mostly in females
- (c) Diverticulum of the urethra or bladder
- (d) Hypertrophy of verumontanum
- (e) Ureteral meatus stricture
- (f) Nerve lesion

As to treatment:

(1) Drugs long used, some with benefit, mostly without benefit
- (a) Belladonna-atropine
- (b) Strychnine
- (c) Sodium salicylate
- (d) Potassium citrate
- (e) Theobromine sodium salicylate

(2) Fluid restriction tried with poor results

(3) Diets of various kinds have been tried. Dry food, no sweets, no salt, no seasoning

The German pediatrist forces fluids up until noon and at 4:00 p. m. gives no liquids, but bread, butter, eggs, fish, ham, herring. Vegetables may be added after several months of continence.

(4) Awake patient at intervals during the night

(5) Make patient sleep on side, not on back

(6) Psychologic treatment

(7) Punishment

I feel there is value in all that has been written, yet since statistics proved that only 58 per cent have been cured under the older methods, then there is opportunity for further study.

With the coming of the infant cystoscope and the interest shown by the urologist of today, I personally feel we can add to and considerably raise the 58 per cent cure.

By investigation at once as to whether a child suffering with enuresis has any anatomical defect that might be an etiologic factor, I have found in nearly 100 per cent of my cases this to be the cause. One cystoscopic examination with adequate treatment at the time has relieved the condition. I present several typical histories from my series of cases.

Case 1.—E. G., a boy, aged 2, had enuresis. Cystoscopic examination showed a strictured urethra. Only a filiform catheter could be passed. One dilatation resulted in permanent cure.

Case 2.—J. K., a girl, aged 4, by cystoscopic examination was found to have a congenital valve of the urethral orifice. One cystoscopy relieved the symptoms.

Case 3.—N. C., a girl, aged 6, had enuresis which was treated with drugs for two years without result. At cystoscopy, a congenital valve was found and relieved with one treatment.

Case 4.—B. K., a boy, aged 7, had had enuresis all his life. At cystoscopy only a 6 F. catheter could be passed. He was dilated once and his symptoms were relieved.

Case 5.—L. C., a girl, aged 7, was treated by psychiatrists at a child guidance clinic for two years with drugs, and finally a cystoscopic examination demonstrated granulations of the urethra. With treatment and dilatation her symptoms were relieved.

*Read in Section on Pediatrics, Southern Medical Association, Thirty-Fourth Annual Meeting, Louisville, Kentucky, November 12-15, 1940.

Case 6.—J. J., a girl, aged 14, had had enuresis all her life. Cystoscopy disclosed a stricture, even a 20 F. sound tight, and deep granulations. Treatment and dilatation relieved the symptoms.

Case 7.—Mrs. W. L. W., aged 19, had had enuresis for 16 years. She was treated by all methods of drugs and diet. Cystoscopic examination revealed the bladder and meatus to be normal. She had a double kidney on both sides and double ureters with one opening into the vagina. She was operated upon and her symptoms were relieved.

Discussion follows paper of Dr. Spence, page 832.

UROLOGIC ASPECTS OF ENURESIS*

By HARRY M. SPENCE, M.D.
Dallas, Texas

INTRODUCTION

This panel discussion seems to me to be wholesome evidence of the increasing respect and confidence between pediatrician and urologist. I can see no harm in openly stating what everyone here knows to have been the case, namely: that their previous relationship has too often been marred by mutual distrust and ignorance of the viewpoint of the other. The chronic complaint of the urologist has been that the pediatrician overlooks or fails to realize the gravity of the urological aspects of a case until too late for the consulting urologist to salvage damaged renal tissue. On the other hand, the pediatrician can truthfully point out that by far the majority of the urologic disorders of childhood, such as acute pyelitis, enuresis and masturbation, are of a self-limited and comparatively minor nature, which he is far better qualified to handle by conservative measures than is the urologist with his formidable and expensive armamentarium. In the past, the pediatrician has been impressed by the ordeal of a complete urologic investigation under inhalation anesthesia, and, in seeking to avoid the horrors of the cystoscope, has unintentionally allowed irreparable changes in the urinary tract to take place; or he has felt that an insignificant urologic ailment was often made worse by the severity of the examination. Dr. Pace will explain how fortunately these objections have now been largely answered by the newer developments in the field, including excretory urography, smaller and more refined infants' and children's cystoscopes, and greater choice in anesthetic methods. On his part, I think the urologist should honestly admit that often by temperament and usually by training he is less suited than the pediatrician to control a petulant, ill child and an apprehensive, interrogating mother. While the phrase is a platitude, by "close cooperation" the excellent brand of pediatric urology already initiated by Henry Helmholz and Meridith Campbell may be furthered by us all.

*Read in Section on Pediatrics, Southern Medical Association, Thirty-Fourth Annual Meeting, Louisville, Kentucky, November 12-15, 1940.

*From the Urological Department of the Dallas Medical and Surgical Clinic, the Freeman Memorial Clinic, and Baylor University College of Medicine.

UROLOGICAL ASPECTS OF ENURESIS

For the purpose of this discussion, I have somewhat loosely defined enuresis as bed-wetting in a child over 4 years of age. Dr. Hopkins has told us of her practice of immediately referring the enuretic child to the urologist for a thorough special work-up when confronted with this problem. She is to be commended for this most salutary attitude, which is in line with the best medical viewpoint of making a diagnosis before instituting treatment or labeling a complaint as purely functional. By her plan, potentially harmful disorders in the urinary tract will be detected at once, and, if no organic changes are found, the sense of assurance, as she utilizes psychotherapy and conservative measures, is valuable. On the other hand, in the absence of gross urologic disease, the more common plan of a two or three months' intensive medical regimen (encouragement, no punishment, regulation of fluids and diet, belladonna, sedatives, alarm clock, and so on) directed against the enuresis will cure approximately 95 per cent of the cases according to Campbell, and such a program can hardly be criticized.

Now, we approach the crux of the problem. If obvious disease be present, particularly as evidenced by the red flag of pyuria, or if the response to medical therapy be not satisfactory, further delay in carrying out an adequate urologic investigation is indefensible. The old sops that the child will outgrow it, it is an "acid condition," and similar meaningless evasions have no place in modern pediatric urology unless fortified by negative urographic and cystoscopic data. The necessary extent of the examination is best determined by the urologist for each case individually and need not be gone into here beyond stating that, in general, it parallels similar studies in adults. I shall outline the procedure followed by us at the Freeman Memorial Clinic

in resistant enuretics referred from the pediatrician.

In the case of females, with the child in the lithotomy position, the external genitalia are inspected for signs of superficial irritation, discharge and the like. The meatus is then swabbed with an antiseptic solution, a sterile No. 12 French soft rubber catheter is grasped a few inches from its eye with bare clean hands and a bladder specimen obtained for routine urinalysis, Gram stain is made of the sediment, and culture. We have seen no infection attributable to this simplified technic of catheterization. If the urine shows evidence of infection, or if there is pain conceivably of renal origin, we make a plain roentgenogram and excretory urogram (intravenous pyelogram) to obtain information about the upper tract. If indicated, these are, of course, supplemented by ureteral catheterization and retrograde pyelograms. In the large majority of cases in our experience, however, the catheterized specimen is normal or only slightly infected and enuresis is the sole symptom. If this be the case and we feel that the upper tract is reasonably free from suspicion, we now proceed with what to us has been the most fruitful part of the investigation, namely: a cystoureteroscopic observation and search for urethral disease with particular attention to the caliber of the urethra, the occurrence of papillary or cystic masses in the channel and at the bladder neck and a granular hobnail appearance of the urethral mucosa. The McCarthy foroblique lens in the routine cystoscope, the panendoscope, or the special child's cystoscope gives by far the most satisfactory visualization of the urethra. Even in the smaller children, this examination is readily done without anesthesia other than a topical local application.

It is now generally recognized by urologists that urethral lesions are the predominant cause in women of the extremely common disturbances of micturition associated with normal urine as well as being the cause of recurrent urinary tract infections by acting as disseminating foci. The characteristic cystoscopic appearance of the urethra is that of a non-suppurative, roughened, granular, inflammatory process often associated with papillary or cystic masses. The urethra in such cases is usually diminished in caliber and is less elastic than normal. The term "chronic granular urethritis" is conveniently used to designate and cover all these changes. We believe with Folsom that these changes arise from infection entering the glands of the urethra from the exterior (for example, diaper infection). In a paper before this Section in 1934, Folsom discussed the pathologic and clinical featues of this malady in detail.

Restricting ourselves to the role of the urethral lesions in resistant enuretics in some 40-odd girls carefully examined as outlined at the Freeman Clinic, we found in almost every case granular urethritis and its associated changes as the predominating and often the only lesion. That this entity was the etiologic factor in these cases was demonstrated by the uniformly favorable response to treatment by systematic urethral dilatation and fulguration of proliferative lesions in a few instances. Concomitantly with the improvement in the bed-wetting, the diurnal frequency and dysuria rapidly cleared. I believe that in some of the cases cited by Dr. Hopkins the beneficial effects of the cystoscopy were really due to the urethral dilatation incidental to the examination. In our group more protracted treatment was usually needed, although we have seen a few of the dramatic cures such as she mentioned.

In the young boys, Dr. Pace will show the importance of looking for unsuspected gross disease in cases of pyuria. In our investigation of enuresis in a boy, we must first exclude conditions such as Dr. Pace presents; for bed-wetting is often a part of their symptomatology. Determination of the residual urine by catheterization is a simple and valuable test and can easily be carried out by the pediatrician. The question of the value of circumcision in male enuretics is frequently raised by parents. In our experience, the presence or absence of a foreskin *per se* bears little relation to the bed-wetting habit unless a balanitis be present. However, we have been strikingly impressed by the small or pinpoint external meatus as a cause of enuresis. We presume that the mechanism is a hyperirritability of the voiding reflex set off by a few drops of urine retained in the fossa navicularis behind the constricted external orifice. The condition is readily corrected by meatotomy.

In older boys observation cysto-urethroscopy can usually be done under topical anesthesia as in the girls. However, where necessary, we have not hesitated to use gas to permit a rapid inspection of the bladder neck and urethra. Where urethral changes have been found, dilatation with bougies and the instillation of a few drops of 0.5 per cent silver nitrate solution to the posterior urethra have served us well in treatment.

SUMMARY

We believe the management of enuresis resolves itself into three parts:

(1) A general sizing up of the case by the pediatrician and a brief period of conservative medical treatment. This will cure the majority of cases.

(2) If this regimen is unsuccessful or if at any time pyuria, hematuria, fever or any other symptoms suggesting genito-urinary disease be present, the case is one for thorough investigation by the urologist. The cases of major disease will thus be detected and appropriate treatment carried out.

(3) In the majority of the refractory cases in girls, a chronic granular urethritis will be found to be the basis and its response to treatment is most gratifying. The necessary dilatations can be easily carried out by either the urologist or the interested pediatrician. In the refractory group of boys, after major disease and pinpoint meatus are excluded, dilatation and instillations are quite satisfactory.

In this discussion, we have purposely presented only our own personal beliefs, experiences, and practices. For a complete review of the literature and discussion of the causes, types and therapeutic results in enuresis the recent article by Stockwell and Smith is most excellent.

DISCUSSION (*Abstract*)

Symposium on Pediatric Urology, papers of Dr. John E. Ashby, Dr. John M. Pace, Dr. May Agness Hopkins and Dr. Harry M. Spence (Papers by Dr. Ashby, "Pyuria," and Dr. Pace, "Chronic Urinary Infections in Children," appeared in the July issue, pages 742 and 745.)

Dr. Grayson Carroll, St. Louis, Mo.—This symposium is held primarily to promote a better understanding between the urologists and the pediatricians. The urologist has this feeling: that he is seeing disease in adults which was caused by failure to recognize and correct pathologic conditions of childhood. Candidly, urologists feel that the pediatrician is not having his little patient thoroughly examined. It is not a question of bread and butter for the urologist or the pediatrician. We are seriously concerned about the patient, not the physician. Many papers have been written and the symposium presented here this morning adequately covers this field. Is there some other element in this situation that can be uncovered at a meeting like this?

May we ask, has the urologist failed? He certainly must have; and, wherein has he failed? Is it because he is too drastic in his procedure of examination and application of treatment? Is it because he failed to handle the child and mother properly so that when the patient returned to the pediatrician, the mother and patient both were unhappy and dissatisfied with their experience with the urologist? Is it because when the patient is referred to the urologist, the urologist fails to accomplish anything, and the pediatrician feels it useless to refer his little patient?

The urologists have met with you to strike a few blows and divest themselves of their grievances and at the same time expose themselves to your criticisms. There is a statement that appeals to us as being a fact, simply because all the urologists in different parts of the country seem to agree upon it; that is, many pathologic conditions in infancy and childhood are being overlooked and causing irretrievable damage in adult life.

The patient with so-called pyelitis apparently recovers in the hands of the pediatrician and the underlying condition passes out of his hands. Later he is seen by the urologist.

Dr. May Agness Hopkins, Dallas, Tex.—I think that the failure of urologic examination has come from several different causes. In the first place, the first work that was done by urologists was done upon adults. The minute I suggest to a mother that her child have a urologic examination, she tells me about Mrs. So-And-So who nearly died with pain from a cystoscopic examination. Then I have to go into great detail to explain to her that there is a difference between the child and the adult and if the condition is treated early, there is no pain. That is one reason why it is difficult to persuade the parents to permit an examination.

There is another reason. It is because some of these children have a nervous manifestation along with their enuresis. It is the pediatrician's fault if the urologist has no success. When I refer a case I try to see the urologist personally beforehand and explain to him what type of patient he is going to have. I already know the type if I have had the patient previously.

Do not think it is easy to refer these cases. In the case with which I had the most success it took me a year and a half to persuade the mother to have the cystoscopic examination made, but I kept at it because she kept after me for relief. The child continued to have enuresis.

We must have enough will power and apply a little psychology in overcoming many of the other etiologic causes for this condition. And the urologist, since he does not handle children frequently, must do a little more studying of them from a psychologic point of view, because there is a trick in that.

Dr. Harry M. Spence, Dallas, Tex.—I should like to address my remarks to the urologists. Last night Dr. Carroll told me that he thought one of the reasons the urologist does not see the child early is that often after a thorough study the urologist has nothing to tell the mother and the pediatrician. In other words, the work has been done uselessly or in vain. Perhaps some of us are overlooking granular urethritis, which not only gives us something to talk to the patient and the physician about, but also gives us something to treat to get the child well.

I should like to start the panel discussion by asking the pediatricians if they can quote a shred of evidence or if they can honestly state that alkalinization of the urine *per se* has any effect upon urinary tract infection.

Dr. John E. Ashby, Dallas, Tex.—I do not think that anyone thinks that alkalinization is of any value in

bacteriostasis because we cannot get enough alkalinity to do any good. Probably 7.8 to 8 is as high as we can reach. However, it is valuable in relieving pain and dysuria and frequency in children, as advocated by Helmholz, Campbell and others.

Dr. Burnett Wright, Nashville, Tenn.—I want to call attention to the common practice of considering an intravenous pyelogram a dependable indication of renal function. Some very serious errors may come as a result of that practice. Von Lichtenberg and Swick mentioned early in their reports on intravenous pyelography, that at times a perfectly normal kidney would not concentrate this dye. So if one does only, as has been mentioned here in one of the papers, a unilateral pyelogram in his search for disease in children or in adults, he is likely to overlook something on the other side.

We have noted in a number of instances after intravenous urograms that one kidney either failed completely to concentrate the dye or concentrated it much less than the other side, suggesting unilateral disease; but when retrograde pyelograms and functional tests were made, and urine was collected from each side and cultures were made, no trouble could be found. When the intravenous pyelogram was repeated another day, the suspected kidney would concentrate the dye in the same degree as was found on the opposite side. So do not consider an intravenous pyelogram as an infallible functional test.

In the case of congenital valves and contractures of the bladder neck, associated with megalo-ureters and hydronephrosis, a warning should be sounded as to the danger of suddenly emptying these pools of urine. These children must be decompressed in exactly the same manner as an old prostatic who has been carrying a residual for a long period. Satisfactory pyelo-ureterograms can be secured, as a rule, by simply putting the child in the Trendelenburg position and filling the bladder with an opaque solution. With a little massage on the bladder the residual will enter the ureters and pelves by reflux.

This has been a most instructive set of papers to me. It is a subject in which I have been interested for a number of years. Children who do not get well promptly of their urinary tract infections deserve, as has been said here, complete urologic examinations. It has not been very long in our recollection since cystoscopic examinations of adults were considered formidable things, to be done only when other diagnostic means had failed, and now no one will deny the advantage of a study of that sort in a grown person. There is the same reason for giving these children a complete, thorough urologic study.

Dr. Gilbert J. Levy, Memphis, Tenn.—A factor that no one has mentioned is the economic side. Those of us who live in the South, particularly our members, know that if the patient comes from a family with a very moderate income, and requires cystoscopic examination and pyelograms, consideration should be given to that fact. I know from several experiences in the past that sometimes the hospitalization, the use of the operating room and the urologist's fee are well over $50, and not everybody can pay that. That is a point for the urologist to consider.

I think the pediatricians have learned that there is a urologic side to many of their cases and I for one have benefited from the work of the urologist.

STOKES-ADAMS SYNDROME*

REPORT OF TWO CASES TREATED WITH METRAZOL

By M. J. Myres, M.D.
Daytona Beach, Florida

Two cases of Stokes-Adams syndrome are herein reported to call attention to the possibility that this condition may occur much more frequently than present statistics seem to indicate, and that the results obtained with metrazol in the treatment of this symptom-complex indicate that this remedy will not only alleviate symptoms, but also may prolong whatever term of life be left to such sufferers. Our results with metrazol corroborate those reported by Lueth,[1] who treated four patients with it, two of whom were greatly benefited, one slightly improved, and only one of whom had no benefit. Both of our patients had typical Stokes-Adams attacks previous to the administration of metrazol. After treatment had been begun, one had only two subsequent attacks, while the other had but a single attack.

CASE HISTORIES

Case 1.—Mr. A. came to me early in 1939, referred by Dr. Edward Brooks, of Toronto, who gave the following history. In 1935 it was found that the patient had a diabetic condition, which was aggravated by a fractured left femur. While in the hospital at that time he developed an attack of fibrillation with a sudden drop in blood pressure. On recovery from this attack, his pressure had returned to 140/80. His diabetic condition was kept within satisfactory limits, but in the summer of 1937 and in January, 1938, the patient had two attacks of myocardial insufficiency, the last one characterized by faintness, a feeling of sudden weakness and cold sweat, but no heart pain. He was still very weak when examined twenty minutes later, pulse thready, blood pressure low, pulse rate 64, and he showed marked pallor. The provisional diagnosis at that time was either internal hemorrhage or an attack of heart block. Stool examinations were negative for blood. The electrocardiogram done January 11, 1938, showed a negative T wave in leads I and II which is indicative of myocardial change, but probably was not the result of recent damage. His blood sugar at that time was 0.15 per cent.

When we first saw him on January 26, 1939, he had suffered another attack and was in a state of extreme collapse with both pulse and respiration absent. The body surface was cold and moist. During the next four days the radial pulse was absent or so faint and irregular that it could not be obtained accurately, and the heart rate was obtained by direct auscultation. Metrazol medication was started, first in 1 c. c. doses by injection and then by mouth in doses of one tablet every eight hours. Several interesting points were noted

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after metrazol had been begun. The return of a normal intake-output relationship seemed to parallel the return of a more normal state of the circulation. No special study of metrazol diuresis is known to us. Digitalis (1 grain doses of the powdered leaves) was administered at the beginning of the treatment following the attack. We believed that the frequency of the auricles would be best reduced by it.

The electrocardiogram taken on January 11, 1939, by Dr. Brooks, like that taken by myself on March 12, 1939, is that of a right bundle branch block. In my record there is evidence of a transient 3:1 block. The record taken by Dr. Brooks on May 27, 1939, showed a weakness of the left bundle branch.

Case 2.—Mrs. J., a woman, aged 35, had suffered for years from attacks of faintness, following exertion, during which she became cold and her husband could not see her breathe, and could not feel or count her pulse. The attacks were often terminated by generalized convulsions. The patient gave a history of heart trouble since early childhood, but she did not know whether or not she had been a "blue baby." She and her husband were impecunious and refused hospital treatment.

Physical examination revealed a fairly well-nourished white woman, slightly cyanosed and the cheeks somewhat flushed. The lungs were hyperresonant and there was a residual bronchitis, without expiratory prolongation. The heart was only slightly enlarged to the left (4¾ inches), but the right liver-heart angle was markedly obtuse. There was systolic thrill and diastolic regurgitation which was loudest over the third and fourth left costal cartilages.[2 3] Examination of the abdomen and extremities revealed no unusual findings. The knee reflexes were overactive and pupils, although somewhat dilated, reacted sharply to light and accommodation. The uncatheterized urine showed many white cells and a moderate number of casts. She was started on metrazol in the form of the solution, taken in 1½ grain (1 c. c.) doses three times a day and later treatment was continued with the tablets.

The attacks of syncope and convulsions stopped soon after metrazol medication was begun and her convalescence continued during the several months that she stayed in our vicinity. The electrocardiogram showed a well established auricular hypertrophy.

DISCUSSION

In Stokes-Adams syndrome there is a sequence of the following dramatic events: apnea, syncope, convulsions and heart block which may be so severe as finally to cause cessation of ventricular contraction.[4 5] This train of symptoms which are referable to the central nervous system may be due to an anatomical abnormality of the cardiac structure, to a congenital defect in its development, or to interferences with the transmission and distribution of contraction stimuli along nerve and muscle bundles which may have been impaired by toxins of infections or other abnormal tissue poisons.

Many other conditions which must be distinguished are syncope due to carotid sinus pressure, reaction from drugs and toxins,[6] primary cardiac failure, peripheral dilatation of the splanchnic venous reservoirs, and reduction of cardiac output due to aortic structure or pericardial tamponade.

Stokes-Adams syndrome is characterized by cerebral anemia and may be due to asystole arising during the course of myocardial disease. Probably the apnea and convulsions are due to disturbance of the oxygen-carbon dioxide ratio in the circulating blood.[7] The mechanism depends on the alteration of the acid base content of the blood. When carbon dioxide is lost in conditions characterized by hyperventilation as a result of abnormal respiratory efforts (Cheyne-Stokes breathing, emotion, anxiety, diabetic coma) the remaining blood becomes hyperalkaline, and there are intermittent periods of apnea followed by convulsions. Comeau[8] believes that cardiac asthenia is dependent on intrinsic deterioration of nerve tissue and muscle fiber, similar in every way to that affecting the central nervous system. Thus a distinct anoxemia is a primary result of bundle branch, pacemaker block and failure of the extrinsic vagal center (carotid sinus[9]).

As to the electrocardiographic findings in the second patient's condition, they typify those reviewed by Pardee,[10] who said:

"The height of P is excessive, being 2 mm. or more in the lead having the largest excursion; duration of P is excessive, being over 0.1 seconds. * * * The P wave of pulmonary stenosis may also be expected to show the effects of auricular hypertrophy. * * * Since the P wave is due to muscle activity during the spreading of the contraction * * * more electrical potential would be produced * * * and thus the height of P would be increased. * * * It would also be understandable that it would take longer for the contraction to spread through the enlarged auricles, so that the duration of P * * * would be increased."

COMMENT

Both patients showed remarkable symptomatic improvement following the administration of metrazol. A Stokes-Adams attack occurred only once in the first case, after treatment was started, and Mrs. J., the second patient, had only two more convulsions[11 12 13] after metrazol treatment was begun, and during a 4- and 2-months period, respectively, during which they took it, neither patient was taken with subsequent attacks. Both patients died within the year after leaving the vicinity, although they had been warned to continue their treatment with metrazol and that they should acquaint physicians with the apparent help it gave them when

they were stricken with the attack while under our care in Florida. We are well acquainted with the life expectancy of patients with proven heart block or bundle branch block, 3 months to 10 years being the usual extremes and 18 months the mean of remaining span of life.[14]

From our experience in these cases of Stokes-Adams syndrome we feel that the oral administration of metrazol is the most practical method of giving it, as attacks could be controlled and prevented without resorting to injections.

The apparent discrepancy in the action of the drug in respect to convulsion might be commented upon. In the patients described metrazol had an anticonvulsant action, which was probably due to improvement in the circulatory condition and consequent improvement in the oxygen-carbon dioxide ratio of the blood. This action is the result of small restorative doses. When metrazol is used as a convulsant in the treatment of dementia precox the case is altogether different as a large, overstimulating dose is used.

SUMMARY

In two cases reported, Stokes-Adams syndrome accompanied a bundle branch block in one and in the other a pulmonary stenosis, probably of congenital origin.

Both patients were successfully treated with metrazol given in small doses, preferably by mouth, with brilliant symptomatic relief. There was no evidence that the further course of the inherent disease was altered. It is recommended that metrazol be given a trial in the treatment of patients with Stokes-Adams syndrome on account of the excellent results obtained with it in these two cases.

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A PARTNERSHIP IN MALARIA CONTROL*

By W. G. STROMQUIST†
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The development of the Tennessee River is creating a series of artificial lakes which will present the most extensive problem of malaria control on impounded water in the United States. In attacking this problem, the Tennessee Valley Authority has applied a combination of medical, biological, and engineering technics to a degree greater perhaps than in any other area. Various technical aspects of the malaria control program of the Authority have been discussed before the National Malaria Committee at different times by men far better qualified than I. However, regardless of technical excellence in a program such as this, there are many factors which influence its success or failure, and I propose to present a sketch of the development of the malaria control program of the Tennessee Valley Authority, first, to illustrate the far-reaching effects of what seem to be the minor incidents and, second, the extent of adjustment and integration of interest that are essential when a single activity is an element in a multi-purpose program. Such adjustments can well be made so long as basic principles are held inviolate.

Since the Tennessee Valley Authority is a new type of Federal agency, there was no pattern for its organization and changes have been made as the program developed. Indeed, since organization is a means to an end and not an end in itself, it must always be adjusted to changing conditions and circumstances. Reference to departments of the Authority will be made upon the basis of the present organization rather than to attempt historical accuracy. I may also vio-

*Chairman's Address, National Malaria Committee, meeting conjointly with Southern Medical Association, Thirty-Fourth Annual Meeting, Louisville, Kentucky, November 12-15, 1940.

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late traditions of papers presented before this group by rather personal references which will be with the thought that a story of the development of our malaria control program will be of interest and some possible value. For myself I take no credit, but am grateful for having had the privilege of watching the game from the bench since the beginning.

Mr. James S. Bowman was the first TVA man whom I met when I arrived in Knoxville in November, 1933, and for more than two months we lived in adjoining rooms at the hotel and had most of our meals together. He was then as now in charge of the Project Planning Division, which is responsible for the early studies of the projects. This gave me an opportunity to discuss the value of water level fluctuation for malaria control, a problem which at that time had been given no consideration in the Norris and Wheeler projects. The result of this early contact is illustrated by the report on the Watts Bar project in which one section is devoted to the discussion of "malaria control elevations" and the requirements of malaria control are mentioned in other sections of the report.

A few months later I met in Mr. Bowman's office Mr. Dana M. Wood, who was making power studies for the Project Planning Division. He was curious about malaria control fluctuation, which was to him a new feature in a hydroelectric project. Mr. Wood had served on the board of health in one of the Boston suburbs and had been particularly interested in the mosquito control program. This served to increase his interest in the control of anopheline mosquitoes on the Authority's reservoirs. A short time later, he prepared charts showing how the Norris, Wheeler, Wilson and Pickwick Reservoirs could be operated with load transferred from one plant to another in order to provide a weekly fluctuation of the reservoir levels for mosquito control. Dr. T. H. D. Griffitts said that this was the first time that a study had been made of the operation of a series of hydroelectric plants for the benefit of malaria control even before the plants were built.

The Norris and Wheeler Dams were designed by the United States Reclamation Service in their Denver office. This arrangement was made by the Authority in order to avoid delay in building up their own design organization. A conference was held with Mr. J. L. Savage, Chief Design Engineer, during one of his visits to Knoxville to discuss the possibility of providing for a higher pool elevation in the Wheeler Reservoir to make possible a seasonal fluctuation for stranded drift and flotage. He agreed that the pool level could be increased one foot without affecting the design of the main structure and simply by making the gates, which were not designed at that time, one foot higher. This established a precedent and on all succeeding main river projects a so-called "malaria surcharge" of one foot has been provided.

Early in 1934, the Reservoir Clearance Division was organized with Mr. L. N. Allen as Director and Major H. E. Davis as General Superintendent. When the clearing of the Wheeler Reservoir was being started, a conference was held in Birmingham with Mr. George H. Hazlehurst, Chief Engineer, and Mr. C. C. Kiker, Assistant Engineer, with the Alabama State Board of Health, and Mr. H. A. Wiersema, now General Office Engineer, Major Davis, and me. Mr. George Hazlehurst and Mr. C. C. Kiker indicated that the State Board of Health would consider certain modifications of the regulations governing impounding waters as applied to the Wheeler Reservoir. Following an inspection of the reservoir area, Mr. Kiker recommended these modifications, which were mainly reducing the requirement of complete clearing of a strip 25 feet wide around the reservoir to clearing lesser distances, depending upon the character of the shoreline. It was estimated that this resulted in a saving of approximately $260,000 in the original clearing of the Wheeler Reservoir.

These modifications have been used as a basis and combined with added experience on each reservoir to develop specifications for marginal clearing and drainage for malaria control. A sanitary engineer of the Health and Safety Department is detailed to each reservoir to work closely with the Reservoir Clearance Division in the pre-impoundage preparation. Based upon detailed field investigations, he indicates to the Reservoir Clearance Division the particular areas in which the various sections of the specifications shall be applied. The Maps and Surveys Division is also concerned with this work, more particularly with respect to the drainage of marginal depressions. We could wish for no better cooperation than that which we have had from these two divisions. From time to time there have been some differences of opinion and rather heated arguments, but these have been concerned entirely with methods and results and have been settled in general by trying out some method suggested by one group or the other.

As a result, we believe that we have made a definite contribution in the manner of pre-impoundage preparation of a reservoir, particularly in our present procedure of a final reconditioning of the zone of fluctuation immediately prior to filling of the reservoir. Major Davis, who is now in charge of the Reservoir Clearance Division; his assistants, Mr. Jake W. Williams and Mr. S. S. Hunter; the field superintendents, Mr. Robert F. Holley, who was in charge of clearing at Norris, Guntersville, and Hiwassee Reservoirs, and Mr. Pat A. Miller, who was in charge of clearing at the Wheeler, Pickwick, Chickamauga and Watts Bar Reservoirs, deserve honorable mention for the contributions which they have made.

In the organization of the Tennessee Valley Authority as it is now functioning, the Health and Safety Department is responsible for the development of the malaria control program and technical supervision and the Reservoir Property Management Department, of which Mr. L. N. Allen is the Director, is responsible for the physical application of the plans promulgated by the Health and Safety Department. This is on the principle that the Reservoir Property Management Department which carries on other operations could better handle details of equipment and supplies and adjust personnel and equipment to other activities so that the Health and Safety Department could devote its efforts entirely to the technical aspects of the program.

Obviously such an arrangement, desirable as it may be, presents complications. For example, one point of view was that our department should present to the other department plans for the malaria control operations at the beginning of the season to be carried out by them just as the construction engineer at one of the dams would give the construction superintendent a set of plans and specifications. The Health and Safety Department then would make only the necessary inspections to assure that the program was carried out properly. Since malaria control requires adjustment to seasonal and other factors, the error of such a position is plain. Misunderstanding was, however, mostly at the field level and due to the need for more specific interpretations of relative responsibilities.

Because of the unsatisfactory relationships, the two directors appointed an interdepartmental committee with Mr. J. Ed Campbell as chairman representing the Reservoir Property Management Department, Dr. D. A. Reekie and Mr. W. G. Stromquist, representing the Health and Safety Department. This committee prepared a "Memorandum of Understanding," rather brief but setting forth the objectives of the malaria control program and the part which each department should play in it. The following major principles were established:

> That the Authority has the responsibility of carrying out a malaria control program to the satisfaction of the health department of the state in which a project is located so that the impoundment will not result in increased transmission of malaria.
>
> The production of anopheline mosquitoes is affected by so many variable factors that the mosquito control program for a season can be planned only in a general way with respect to personnel, equipment and supplies and the program must be flexible so that its activities can be changed quickly as conditions change, even from day to day. Thus, the detailed planning and execution must be practically coincident.
>
> The malaria control program is a program of the Tennessee Valley Authority and cannot be departmental in character. It must, therefore, be a partnership based upon mutual confidence and respect.

This "Memorandum of Understanding" was submitted to the property managers of the Reservoir Property Management Department, the resident sanitary engineers of the Health and Safety Department and other personnel directly concerned and, after having had opportunity to review it, a meeting was held for free and open discussion. It was decided that responsibility for the malaria control operations in the reservoir area should be centered upon one man who is the resident sanitary engineer. In the technical aspects of the program he is responsible to the Health and Safety Department and in the business administration, that is, personnel, equipment, and so on, he is responsible to the Reservoir Property Management Department. The effect of reaching an agreement upon this "Memorandum of Understanding" was immediate and astounding. The operations during the past two seasons so far as relationships of personnel of the two departments are concerned have been running far more smoothly than any of us had hoped.

I do not mean that differences of opinion have been entirely eliminated, but they have been settled by frank discussion. Nor are differences of opinion objectionable at times, since without them we should make little or no progress in developing better methods. The work of the interdepartmental committee with respect to settling differences which cannot be agreed upon in the field has been extremely light. Credit for the success of this committee is due mainly to Mr. J. Ed Campbell.

The operation of the Authority's reservoirs for multi-purpose uses is directed by the Water Control Planning Department with Mr. S. M. Woodward as Chief Water Control Planning Engineer. The fluctuation for malaria control introduces an additional complication to a complex problem of adjusting releases from the various dams to variations in stream flow, and best to serve the programs of navigation, flood control, power production, and other activities. Prior to the mosquito breeding season, the Health and Safety Department submits to the Water Control Planning Department tentative schedules of fluctuation for each reservoir considered to give the most favorable results in mosquito control within the definite limitations of each reservoir. These are proposed with the definite understanding that there will be temporary interruptions such as higher elevations during summer floods. The Water Control Planning Department adjusts these proposed schedules to the needs of other activities, but in general have provided favorable fluctuations. During part of the past season this was not true, for the Authority was faced with a critical situation of a record-breaking long period of deficiency in rainfall which precluded the filling of the storage reservoirs, low stream flow during part of the season, followed by unusual rainfall, and a power demand much greater than had been anticipated, which taxed the capacity of the power plants. Particularly in the Wheeler and Guntersville Reservoirs high water elevations were maintained during the early part of the season, which resulted in high production of *Anopheles quadrimaculatus*, but after these conditions were described emphatically to the management, releases of water were ordered by the Water Control Department and favorable schedules maintained throughout the rest of the season except for interruptions by two unusual summer floods.

Assistant to Mr. S. M. Woodward and in immediate supervision of determining reservoir operating schedules is Mr. N. W. Bowden. His first job after completing his engineering course was with the Army engineers on a topographic survey of the Tennessee River from Decatur to Florence, Alabama. In a party of twenty-six men, he rose from the lowest rank, axeman, to chief of party from the early part of July until late in October by being advanced each time a member of the party contracted malaria. Shortly after reporting to the District Engineer's office in Chattanooga, he also had a severe attack of malaria.

Dr. H. A. Morgan, Chairman, Board of Directors, was formerly State Entomologist of Louisiana. During that time he studied some fifty-odd species of mosquitoes, including the *Anopheles quadrimaculatus*, and states that he still suffers from the devitalizing effect of malaria which he contracted at that time. In a recent conference, Dr. Morgan drew a circle with radiating lines into it and said that the circle represented the malaria control program and that all other activities of the Authority must be tied into that program.

We regret that Dr. Morgan and Mr. Bowden had to suffer from malaria, but since that was decreed by the fates and is now a thing of the past, it has been of considerable value to our malaria control program that two positions which affect it greatly are occupied by men who from personal experience appreciate the value of malaria control.

The relations between the Authority and the state health departments have been indicated by the approval by the state health departments of Alabama, Tennessee, North Carolina, and Mississippi, in which the present impoundages are located, of specifications for marginal clearing and drainage which modify the regulations governing the impounding of water. These modifications have resulted in considerable saving in the original cost of clearing and have provided shorelines more favorable for the post-impoundage malaria control operations. As another instance of this partnership is cited the fact that representatives of the Health and Safety Department were invited to assist in preparing the final draft of the regulations which were adopted by the Tennessee State Department of Public Health in 1936. It has been our policy to contribute so far as possible to the broader program of malaria control within these states.

When the most difficult malaria problem areas of the Wheeler Reservoir were designated as a migratory water fowl refuge to be operated by the United States Biological Survey, it was apparent that the stage was set for a localized and intensive conflict between the two interests of wildlife conservation and malaria control. Some of the earlier conferences to agree upon the operation of this area could readily have degenerated into the typical school boy debate consisting mainly of "It is too" and "Tain't

neither." It was agreed that more scientific data were essential and that these should be collected in a joint study where representatives of the two groups would "see the same thing at the same time." Conclusive evidence is not yet available, but results so far indicate that the malaria control measures employed in the Authority's reservoirs are probably not so detrimental to fish and waterfowl as the wildlife interests had feared. The greatest progress which has been made, however, is that of better mutual understanding of each other's problems and an ability to discuss them objectively rather than emotionally. A good illustration is a project now proposed for dyking certain areas in the Wheeler Reservoir to be dewatered for mosquito control during the summer and refilled as resting and feeding grounds for migratory waterfowl in the winter.

There are other programs of the Authority such as those of the Agricultural and Forestry Departments with cooperating agencies which we believe will have a definite, although perhaps indirect, effect upon malaria in the region. With control of soil erosion, reforestation, diversified and improved agriculture, which can be expected to raise the economic level, there is little doubt that rural malaria will be reduced. Rural electrification which will make refrigeration and preservation of fresh foods available to rural homes will go far to improve the diet of rural families, which has been one of our problems.

The technical problems have been varied, a number of them difficult and yet to be solved. Non-technical factors which have influenced the development of our malaria control program have also been interesting. In this we have had the sympathetic support of our management to the extent that what might otherwise have seemed at times a hopeless task has been one which has challenged our best efforts. Had we set out with a rigid insistence upon placing malaria control paramount above all other objectives of the Authority without a willingness to make necessary adjustments to other activities, so long as fundamental principles were not sacrificed, we are sure that less progress would have been made and that we would now have found ourselves in a weak position without the assistance which we now have from other departments within the Authority and from outside agencies.

ENGINEERING IN MALARIA CONTROL*

By C. C. KIKER, *Chairman*
Wilson Dam, Alabama

The Sub-Committee on Engineering is charged with studying and reporting on the engineering features of malaria control. This year the report has been limited to recent developments and progress along the following activities:

(1) Drainage and the alternates of filling, dyking or dewatering to permanently eliminate *A. quadrimaculatus* breeding areas.

(2) Use of mosquito larvicides.

(3) Mosquito proofing houses.

(4) Application of engineering methods to effect biological control of the malaria vector.

Information for this report was obtained through correspondence with the various state health departments and other organizations directing malaria control work.

Under Item 1 comes a report from Perry, Florida, to the effect that the local mosquito control organization constructed a small dredge from second-hand material which was used to deepen the center of a natural pond and fill the shallow margins, thus eliminating an objectionable *A. quadrimaculatus* breeding area. It is understood that a detailed description of this work will appear in the Public Health Reports in the near future.

From Pensacola, Florida, comes the report of the Escambia County Health Department's continued research on permanent ditch lining for drainage structures. The "Pensacola type" concrete invert, reported on at our 1938 meeting, has been adopted as the standard for the State.

From Alabama comes the report that the Tennessee Valley Authority plans to dyke a large flood plain flat in the central part of the Wheeler Reservoir and dewater through pumping during the summer, thus eliminating an area which has proven both difficult and expensive to control for *A. quadrimaculatus* production. Other similar areas in Authority reservoirs are being studied for dyking and dewatering or filling.

In North Carolina a dyking project is under

*Report of Sub-Committee on Engineering, National Malaria Committee, meeting conjointly with Southern Medical Association, Thirty-Fourth Annual Meeting, Louisville, Kentucky, November 12-15, 1940.

construction to minimize the problem resulting from overflow of low-lying areas adjacent to a river.

Under Item 2 comes the report from Tennessee of the Tennessee Valley Authority's use of a boat for applying pyrethrum larvicide on some conservation pools in the Norris Reservoir Area. The larvicide is introduced into the suction of a pump being carried 50-75 feet by a water stream to the point of application.

A further expansion of airplane dusting was made when the United States Engineers' Department employed a contract plane for emergency application of larvicidal dust on its flood control Sardis Reservoir in northern Mississippi.

Under Item 3 it is pointed out that the need for improved housing as the basis for a more effective approach to mosquito proofing is being given consideration in many quarters.

From Alabama comes the report of a further expansion of the house mosquito proofing project in the central part of the Wheeler Reservoir. A total of 700 houses has been mosquito-proofed to date. Approximately one-half this number was gone over with an annual repair operation last spring. All of the work has been handled by contract under the administration of the Alabama Department of Public Health.

Mosquito proofing activity was reported from several other Southern states. Organizations, as the Farm Security Administration and the National Youth Administration, had cooperated with local health departments in planning and executing the work.

As to Item 4 very little new progress was reported on the application of engineering methods to biological control of the malaria vector. From Alabama, however, comes the report of a demonstration of the control of submerged aquatics on a 25-acre lake by fertilization.

Prior to the application of fertilizer the lake supported a heavy growth of *Chara* and *Naias* which at times produced *A. quadrimaculatus*. After a season of applying 100 pounds of 6-8-4 fertilizer plus 10 pounds of nitrate of soda per acre at 4 to 6 weeks intervals during the growing season the objectionable plants disappeared. The theory given for control of the aquatics in this way was that the fertilizer increased the amount of available food for microscopic organisms which obscured the light necessary for photosynthesis and growth.

EXPERIMENTAL WELLS*

THEIR USE IN THE STUDY OF THE WATER TABLE IN RELATION TO A MALARIA CONTROL DRAINAGE PROGRAM

By DAVID B. LEE†
Jacksonville, Florida

In the present discussion, the term "experimental well" refers to a hole six to eight inches in diameter, dug in the ground with a post-hole digger, lined with concrete sub-soil pipe six inches in diameter by one foot long, with the lower end of each pipe notched to permit of free entry of ground water. The hole is dug deep enough so that the well will always contain water, even after drainage is instituted. The elevation of the top of the uppermost tile is recorded, and a bench mark set at this same elevation beside the well.

At the onset of the malaria control program in Escambia County, Florida, it became necessary, because of associated agencies contributing financially to the work, to demonstrate exactly how much drainage and how much associated fill would be necessary in any indicated locality to render that area free from the breeding of *Anopheles* mosquitoes and still effect no improvement of property more than accomplished as a side issue of control. This new restriction imposed upon drainage plans has resulted in the development of a procedure which has proven to be most useful for the work of this department.

The experimental well was devised and placed in operation to demonstrate, by a study of the water table, the limits of the actual needs of malaria control drainage. Naturally, malaria control drainage is primarily toward the disposition of residual waters. Provision must be made for storm waters when they contribute to semi-permanent waters. It is obvious in malaria control that these residual surface waters, which breed *Anopheles*, must be removed. Once this water is removed, the problems of the needs of lowering the ground water levels are not so obvious. After residual waters have been removed, the varying subsequent elevations of the water table will become evident, in a general manner, through the trial and error method of observing accumulations of surface waters after rains of varying intensities.

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†Chief Sanitary Engineer, Florida State Board of Health.

The experimental well affords us a more precise method of following the variations in the water table throughout all seasons, with relation to rise in its elevation with known quantities of rainfall, and finally with reference to the lowering of this table through installation of a drainage system.

In Pensacola, Florida, a preliminary trial was made of this procedure to determine the action of the water table. This study was begun in the early part of 1938, in one area chosen for drainage by the malaria department.

An engineering study of the district was made. It was evident that, whatever might develop later in subsequent detailed plans, the outlet, as always, was the first step. The type of construction of this outlet could be planned and installed immediately. Relying upon the principles that an outlet must be of sufficient capacity to dispose of the volume of water to be removed, and that the outlet should be installed at the lowest effective elevation, a city storm sewer already constructed with its outlet was found to answer these needs. A connecting system with this outlet was planned and installed. This removed a large portion of the surface water and resulted in a considerable area's being above the water table.

It was at this point that the wells were installed. Twenty-five wells were placed in the manner above described, at appropriate locations.

Reading the water elevations in the wells was accomplished by using an engineering rule and measuring the distance of the water level below the top of the wells to one-hundredth of one foot and recording these elevations in terms of mean sea-level.

Routine readings were made of these wells every day, with very few exceptions, from July, 1938, until January, 1940, or for about one and one-half years. Also, additional readings were made to determine the effects of known rainfalls on the elevation of the water table, and the lowering of this table at intervals following these rains.

The well study has yielded valuable information on the following subjects:

(1) Ordinary fluctuation of the water table under conditions of rain and drought.

(2) Time necessary for lowering of the water table after rains, with no drainage system existent.

(3) Evaluation of the effectiveness, in lowering the water table, of each new unit of drainage system installed.

(4) Height of fill indicated as necessary to avoid standing water and amount of extra fill which should be added as a factor of safety. Effect of fill on the water table.

(5) Determination of the function of the system as planned and installed: whether adequate or whether more units are necessary.

(6) Variations in porosity of soil throughout the area.

(7) Action of seepage water and location of intercepting drains.

Due to limitation of time, it will be impossible to cover all of these topics, and impossible to cite all supporting data, in the present paper. A paper covering the subject completely will be presented for publication later.

First topic to be discussed will be:

Fluctuation of water table as demonstrated by well readings under varying natural conditions of rain and drought, and time necessary for lowering of water table after rains.

The study on which the following observations are based comprises 435 days' readings of the well in question.

The area in which this particular well, well No. 9, is located, is in the shape of a triangle, with the two legs of the triangle bounded by railroad tracks and the base bounded by a road. The only economical possibility of drainage was toward the apex of the triangle.

In all the readings of this well the high elevation of the water was never more than slightly over 4 feet. At this elevation, ground water became surface water, and run-off limited the elevation beyond this point.

To demonstrate the use of experimental wells, several typical periods have been selected.

A four-day period, from July 15 to 19, 1938, showed the water table at 2.3 feet, or 20½ inches below the surface of the ground. During the six days immediately following this, 8 inches of rain fell, and on July 25 the water table in the locality rose 2 feet to 4.3 feet, and surface water was flowing off. During the succeeding nine days till August 3, there were light rains, totaling 3.3 inches, and the well readings remained at the same level, the rain being sufficient to maintain the ground in a saturated condition.

From the study of these data, the information is gained that in this area once the ground

becomes saturated a 3-inch rain over nine days will produce surface water at an elevation of 4 feet and below.

Immediately following the above period of rains, there were two days, August 4 and 5, during which there was no rain. Surface water disappeared and the water table fell to 3.6 feet, or about 5 inches below the surface of the ground; during the next four days, Aug. 6-10, there were 2½ inches of rain, and the water appeared as surface water, the well reading slightly over 4 feet; during the next two months, there occurred only 1 inch of rain, and the elevation of the water in the well lowered, gradually, fractions of a foot daily, to register, finally, below 2 feet (1.9).

These data show that 8 inches of rain were sufficient, originally, to produce surface water; that 3 inches over nine days will maintain surface water; that two days without rain will produce a water table just below the surface, but which will produce surface water again with a 2½-inch rainfall over four days.

The first days of drought reduced the water table quickly to a level 5 inches below the surface. Subsequent lowering progressed steadily, very slowly, for two months before the table was again lowered to its original starting point, 20½ inches below the surface.

The well study of this area has demonstrated that an elevation as high as 3.5 feet was of potential danger as a breeding locality, since moderately heavy rains produced standing water at 4 feet elevation, and though a 3.5 feet elevation is quickly reached after rains, below 3.5 feet, the lowering of the table progresses very slowly.

Since surface water could be removed quickly and efficiently, and it was demonstrated that the water table would drop 5 inches below the surface in two days, grading of this area to carry the surface water quickly to a drop inlet was the method of control chosen. This, over the period of a year, has proven to be perfectly effective to avoid standing water.

The subject discussed above has demonstrated the action of the water table with at first a natural, and later a planed surface run-off, the only means of drainage.

The next topic to be discussed will be:

Evaluation of the effectiveness of lowering the water table by each new unit of drainage installed.

Again, one of the many observations in various localities studied is chosen to demonstrate the effect of the drainage system.

The area chosen was a district where ground water levels are directly influenced by the main drainage system and also subsoil drains.

In this particular district, the elevation of the ground is on an average of 2.7 feet above mean sea-level. For this reason, the maximum readings of the wells will be in the neighborhood of 2.7 feet, as, at this point, ground water becomes surface water, and is subject to surface run-off.

The period selected for demonstrating the use of the wells in its relation to the present topic was August 23, 1939, to November 20, 1939. During this period of approximately three months, at least daily well readings were recorded.

During a dry spell over seven days (August 23-30) the water level dropped from the surface of the ground to a point 6 inches below the surface. Immediately following this, 0.7 inch of rain fell on September 1. The water level in the well rose, during the period of 24 hours, 5 inches. During the succeeding two weeks, with no rain, the water table gradually was lowered 1 foot during the first week, and then remained stable at 1.6 feet for the second week.

At this point, a 4-inch subsoil line was installed in the area with an invert elevation of 1.3 feet. After the installation of this line, the water table was lowered an additional 3½ inches in one day to the invert elevation of the subsoil line.

With 0.7 inch rain falling on the following day, the water table was raised only 2½ inches. Previously, in the data cited just above, without subsoils, a 0.7 inch rain had raised this level twice this height, or by 5 inches. The following week, double this amount of rain fell (1.3 inches). Previously, a 0.7 inch rain had raised the water table to the surface, or 2.6 feet. Now, with the subsoil line installed, double that amount of rain left the water table 9½ inches below the surface of the ground. During the eight days following, the level again fell gradually to the elevation of the subsoil line (1.3 feet).

Following this period, for five weeks there was no rain, and the elevation of the table ranged 1.3 to 1.1 feet. Then 2.3 inches of rain fell, which raised the water table to the surface of the ground. In two days, with the subsoil installed, this table was lowered 17 inches, or back to the elevation of the subsoil line (1.3 feet). In the observations made before installations of subsoils, and with only one-third the amount of the present rainfall, one week was needed to reduce

the water table 12 inches instead of the present 17 inches in only two days.

Additional interesting observations exist in association with this situation, as demonstrated by the reading of the wells. It is of practical value to all engaged in malaria control drainage to know how much rainfall will produce surface water. It was previously stated in this paper that this could be determined by the trial and error method of observing the appearance of surface water after a heavy rain. However, after a rain, of amount insufficient to raise the table to the surface, it cannot be stated exactly how close to the surface this level lies. By the data cited, it now is clear that a rain of 1.3 inches left the water table 9½ inches below the surface, and that a rain of 2.3 inches produced surface water, but this water was lowered in two days by the existing drainage system to 17 inches below the surface. Accordingly, it was clear that that particular portion of the drainage system was functioning satisfactorily from a malaria control standpoint, with no additional control indicated, such as extra fill or drainage. In like manner, it has been possible to evaluate each unit of the system installed.

The relationship of well studies to fill will now be discussed under the heading, "Height of Fill Indicated as Necessary to Avoid Standing Water."

Engineering studies made in association with these malaria control operations, indicated obviously that a certain amount of fill was obligatory, as certain areas lay at elevations below the lowest effective gradient of the profile of the proposed drainage line. For these areas, the amount of fill which was necessary to support the drainage system could be accurately determined.

There were other areas where the amount of fill necessary to avoid standing water had to be more carefully studied to evaluate more exactly the cost of the fill as contrasted with other methods of removal, such as a more elaborate drainage system than that originally planned.

In Pensacola, the department has used fill to the extent of 70,000 cubic yards. In association with this work, the well study has rendered valuable information.

The experience of the Escambia County Malaria Department demonstrates the value of the data secured from wells most graphically.

The original engineering survey of this same area, referred to above, demonstrated that surface water was standing as high as the 5-foot elevation and was breeding *A. quadrimaculatus*. The department accordingly decided to fill the district to the 5-foot elevations. The selection of 5-foot elevations was somewhat of an arbitrary decision based on the fact that water was standing on them, and *Anopheles* were breeding. As water had been found, even on the 5-foot elevation, it was believed that this decision was a conservative one, and, perhaps later, higher elevations might have to be taken into consideration, rather than install a more extensive drainage system.

Some time later it became necessary to begin this work of fill, and after considerable work had been accomplished, experimental wells were installed, and readings taken for the first time. The outlet system, which has already been referred to, had now begun to function. The original plan had been to fill the upper reaches to a 5-foot elevation, with a gradual lowering of elevation of fill, determined on an empiric basis, as the region of the outlet was approached.

With the outlet system installed, though lying at a distance of 300 feet from the filled area, it became evident that filling 5-foot elevations was safe; standing water disappeared. However, it was impossible to determine the exact elevation of the water table below the ground's surface.

Well studies were now begun, and well No. 13-A was placed, lying at a 6-foot elevation in the midst of the filled area. The first reading of the well was taken on December 3, 1938. Since the middle of August, or for over a period of three and one-half months, there had been only 2.5 inches of rainfall.

The water table was at 3.4 feet elevation, or about 19 inches below the 5-foot elevation. However, the relatively dry season might have accounted for this level. The water remained at this low elevation for five succeeding weeks, during which time there was little or no rainfall.

Four inches (4 in.) of rain in the following two weeks raised the water table to 4.9 feet, or just below the 5-foot elevation (on February 9).

With light rains ranging from ½ inch to 1½ inches per week during the following three weeks, the water table reached the surface or the 5-foot elevation, and remained stable at this level for three and one-half weeks.

From the facts here presented, and with only light rainfall occurring, it became evident that fill to a 5-foot contour would not be sufficient

under all conditions to avoid standing water at these elevations.

At this point, it was decided to install an 18-inch closed lateral system to assist in the drainage of this entire district. Following this, the water elevation in the well was lowered over a period of three weeks to a new low of 3.1 feet, or 22 inches below the 5-foot elevation.

The value of the well observations became obvious. Fill work is costly. The installation of the 18-inch lateral drain had lowered the whole water table 4 inches lower than the table had ever been, even after a protracted dry season of 3½ months.

A subsequent event proved the adequacy of this system. Sixteen and one-half (16½) inches of rain fell over a two-week period. The water table never rose above 4.3 feet. This high reading corresponded to a day of a 4-inch rain. The following day the water table had been lowered 6 inches to 3.9 feet.

The 5-foot contour for fill, originally elected on the basis of standing water present at this elevation, could now be revised, and it was safe to assume that a 3½-foot elevation for fill would be perfectly safe.

A lesson had been learned, and at not too great expense, namely:

Before and during drainage, study the water table by means of wells.

Study the effects of a minimum drainage system before starting on any but obviously necessary fill.

EARLY TREATMENT OF SQUINT*

By Oscar Wilkinson, M.D., F.A.C.S.
Washington, D. C.

My plea for the early, definite and methodical treatment of squint is brought to you from observations during the past third of a century. At the beginning of that time no one was making any effort really to cure early cases of squint further than by the fitting of glasses. That same laissez faire attitude is being practiced by too many of us today. I have so frequently seen the wisdom of the early treatment of squint expressed in many happy results, and have more frequently seen the baneful effect of late treatment, or of no treatment, that I feel we should assume a more positive attitude in the treatment of young squinters.

That "first glide of the eye" is the time to start treatment for, as Chavasse has suggested, this is the time to prevent the vicious habits which torment us in the future. When there is no definite pathologic condition of the eye, or of the muscle, or of the brain centers, these children, if early and properly handled, will not develop amblyopia, suppression, monocular squint, over-developed, over-acting muscles, under-developed, attenuated muscles, or abnormal retinal correspondence. These, as you well know, produce our headaches in the after years in cases which have been neglected.

The first essential in the early treatment of squint is a proper diagnosis. The answer to the following questions will aid us in making our diagnosis and will guide us in selecting the most efficient treatment.

(1) Is the squint due to ocular disease, muscle disease, or a central pathologic condition?

(2) Is it due to excessive accommodation, the so-called accommodative squint?

(3) Is it due to a dominating vertical imbalance which is caused by a present or past paresis or paralysis of one of the elevators?

(4) Is it due to non-use of one eye from defective vision or defective fusion?

(5) Is it due to a family or individual neurosis or to general inanition and instability?

How are we to make these diagnoses? First, by the general observation of the patient as to his physical condition, his neurotic or want of neurotic exhibitions. Second, by the general observation of the patient's eyes and head tilt, if any, when he does not know that he is being observed. When marked inanition and neuroses are present, we must call in our pediatric friends for assistance.

After this general observation, we should measure very definitely the degree of squint and determine very accurately the presence or absence of refractive defects and the visual acuity in each eye. In measuring the degree of squint, the most accurate method is by the use of prisms, while the patient looks at 20 or more feet and at 13 inches. This is known as the cover test, and this and the comitance test can be used on practically any normal child at 2 years of age if the physician exercises the proper diplomacy and patience. It requires more than

*Read in Section on Ophthalmology and Otolaryngology, Southern Medical Association, Thirty-Fourth Annual Meeting, Louisville, Kentucky, November 12-15, 1940.

one sitting to establish definite measurements. The amount of deviation should be measured at 20 feet and 13 inches in the primary position. It should also be measured in all the diagonal directions at 13 inches. By this method one detects the under-active muscles and the over-active muscles, if present. By this method alone one can detect rather definitely which muscle, or set of muscles, is at fault, and can thus determine the type of operative procedure to be followed to obtain the best correction of the deviation.

In high degrees of deviation in very young persons where there is an entire lack of cooperation, the use of the Priestly-Smith tape as modified by Holzer is recommended for measuring the degree of squint. This method is accurate within two arc degrees and is especially useful in determining the degree of lateral deviation in very young children.

The near point of convergence should be taken in all of these cases, as it is of material assistance in detecting an excessive action of an overdeveloped internus. The motility of the individual eye should now be tested in the cardinal directions of gaze. This test brings out the excessive action or the deficient action of the various muscles of that eye, or demonstrates that there is no over-acting or under-acting muscle.

It is always advisable to measure the squinting child under different circumstances; that is: when rested, tired, calm, and a bit excited. This gives us some information as to just what happens to the child's eyes during its daily life and detects any variation in the degree of squint.

A proper retinoscopy to determine the refractive defect should be done after the eyes have been atropinized for about a week. This should be most accurately done and when in doubt it should be repeated, as these babies cannot respond to questions when using spheres and crossed cylinders. Our retinoscopy is the guide to the prescription for the correction of the defect; hence its importance cannot be too highly emphasized. In passing, I would suggest that it is a good idea to measure the degree of squint while the patient is under the influence of atropine, as our observation leads us to believe that an increase in the amount of squint under atropine is an indication for an early operation. Glasses are ordered or not, according to the amount of refractive defect found, the amount of convergence excess present, and the amount of visual improvement expected to be gained by the use of the glasses.

In high degrees of refractive defects, with astigmatism associated with some amblyopia, glasses are essential. In low degrees of deviation where there is very slight refractive defect, I fear we often order glasses when they are useless. I also want to warn here against the hope too frequently expressed by the parents and at times by some of our own profession that the glasses will eventually bring about the desired cure. My observation brings me to the conclusion that if glasses, occlusion, and a minimum orthoptic training do not materially decrease the amount of deviation in four to six months, operation is not only indicated, but imperative.

Orthoptics.—In very young children orthoptics is usually only of diagnostic value. However, this at times is quite useful. It aids in detecting the acuity of vision and measures the status of binocular vision. This can be done in very young subjects with a bit of tact on the part of the technician and the exercise of the proper skill and judgment. The establishment of the binocular relations of the two eyes helps very materially in making the diagnosis and prognosis. If we can establish that the child has even the second grade of binocular vision at that early age, this in itself is very helpful in making our prognosis.

By occluding of the good eye and forcing the use of the deviated eye, preoperatively we frequently are able to develop the acuity of vision and prevent suppression and, I might add, that this is the first step in preventing abnormal retinal correspondence. After operation these patients should be watched by the orthoptist to see that they are not forming bad habits of vision. If the child has had the habit of suppressing before operation; by the orthoptic training immediately after the operation when the eyes are placed in a new relation with one another, that habit can best be prevented from recurring. Then is the best time to teach the two eyes to work together. Then is the time we are able to assist the innate desire of the child to accomplish binocular vision.

The orthoptic examination of the squinting young subject is now being practiced in many of the ophthalmic clinics in America. Some twenty years ago there was practically no one doing orthoptic procedures on very young subjects. Our method of operating has been changed during the past twenty years and the time of operation has also been changed. We now no longer hesitate to operate upon a child as young as 2 years where there is a definite

stationary deviation of high degree after the child has had the proper preoperative care for a period of from four to six months.

I have seen the operative procedure fluctuate from one side of the eye to the other during the past three decades, from the internus to the externus, and back to the internus. Thirty years ago most men did a tenotomy. Then they began doing advancements, tuckings, and partial tenotomies. Curdy, of Kansas City, introduced the recession operation in 1916, and associated it with advancement. The combination of recession and resection is now the operation of choice in the hands of most American operators. The pendulum has swung too far towards recession in cases of very young subjects. It is so easy to set a muscle back 3 or 4 mm. in each eye and it seems so logical to conclude that convergence excess is due to over-action of the internal rectus muscle that we therefore blame the internal rectus for the whole deformity and make our attack on it accordingly.

To a large extent by doing double recessions we have committed the same fault that was committed by the old tenotomy. In other words, we have definitely paralyzed the power of convergence. This may seem logical from a physical standpoint. That is, we assume that the internal recti are at fault and that their excessive action is due to their excessive strength. This assumption is what has led us into error. In the first place, the extra ocular muscles in the very young child are not in any way too strong or too weak. The convergent squint as usually seen is not due to a muscle's over- or under-action, an extra strong internal rectus or a weak external rectus. It is usually a matter of innervation. Innervation has become excessive due to hypermetropia with associated convergence excess, or has been upset, possibly due to amblyopia, possibly due to a want of corresponding images, probably due to defective images or images of different size or an innate weak fusion faculty. We have made a mistake in endeavoring to cure the deviation in a young child by operating too extensively on the internal muscles. We all admit that we should have a ratio of 3 to 1 with reference to our power of convergence and divergence, and that ratio cannot be maintained if we endeavor to straighten any cross eye of high degree by means of recessions alone.

The procedure which we follow, and which I recommend to you, is to weaken the internal rectus if it can be determined that its action is excessive, but not to weaken it sufficiently to produce a paralysis of the convergence. In our effort to straighten the eyes of the young child, we should certainly not leave them in a worse condition than we found them. That is what happened at times when we did tenotomy alone. That is what happens today when we do recession alone. The trend for operative correction for squint deviation should be towards strengthening by advancement or resection of the external rectus and not by weakening of the internal rectus with too liberal and too numerous recessions.

In our daily life our eyes for work are turned in at a considerable angle, and if we paralyze our convergence by too liberal recessions, we are going to paralyze the child's ability in after life to do prolonged work. Since our object in operating early is to restore the child to normalcy, we should certainly do this by a method that will not leave any after defects which will prevent the normal activity of the eye in after life.

Operative Technic.—Our methods have been described elsewhere.*

We do not claim that any one method of advancement, recession or shortening is better than another, but we do feel that measured operative procedures are absolutely imperative if we wish to secure the best cosmetic and useful results. In cases of marked deviation predominating in one eye a 4 mm. recession with a bilateral measured resection is indicated unless there is a dominant upshoot on lateral rotation. If this is present, if the vertical deviation is either marked or dominant, this should be corrected first. In these cases where there is a spasmodic upshoot due to an excessive action of the oblique in either eye, the oblique should be tenotomized. In lower degrees of internal deviation a measured combination of recession and measured resection should be used. Where the convergence near point is further than 9 cm. it is best to do a bilateral resection. If the convergence near point is closer than 4 cm. a recession is usually indicated. The correction for any under-acting muscle is to shorten it. Over-acting muscles can be dealt with by tenotomy, partial tenotomy, and recession.

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*Wilkinson, Oscar: Surgical Treatment of Concomitant Squint. Arch. Ophth., 2:423-432 (March) 1934.

DISCUSSION (*Abstract*)

Dr. Frank W. Pirkey, Louisville, Ky.—We have all been plagued by adults who want their eyes straightened, usually want them straightened for appearance sake. Perhaps it is a question of employment. Many retail stores, firms which employ salesmen, office buildings, for example, which need elevator operators, do not usually care about the vision of the prospective employee, but they do draw the line at anyone who is cross-eyed. Perhaps it is a question of acceptability for marriage. Or as is often the case, purely vanity. To straighten such eyes as these requires the services of a competent eye surgeon.

I have no desire to minimize this operation, as I believe that a successful cross-eye operation requires considerable practice and judgment. Nor have I any desire to minimize the benefit which these persons obtain from such an operation, either financially or mentally; however, we cannot help but reflect that in some instances we could perhaps have done much more if we had seen the patient early enough.

For the other side of the picture there are many large corporations which will not take on a young man or woman if the individual's vision falls below certain requirements in one eye. This applies especially to such occupations as railroad work, police force or bus drivers. In these times it applies particularly to many branches of our military service.

When we see an adult with convergent squint there is very little hope of any benefit except from a cosmetic viewpoint. With some infants and children we can undoubtedly help, not only to straighten their eyes, but to preserve their vision in both eyes. Not with all, as Dr. Wilkinson has said, but in certain selected cases, if we have made the proper diagnosis, we can obtain wonderful results. If the proper diagnosis is made, then the treatment should be medical or surgical or sometimes a combination of the two. I believe a great many men have become discouraged by not selecting the cases which would benefit by treatment.

As to the treatment, there is no doubt there are many cases, especially of young children which require more time or perhaps more patience than most of us are willing to expend. If we have someone in the office who is trained to do this work, they will probably have more patience with these young patients than the physician would have.

As to the method of operation, I am glad that Dr. Wilkinson allows great latitude. I do not believe that there is any one operation which is adapted to every case. Personally I prefer a combination of resection and recession. Other operators get excellent results with any one of many variations of advancements, tucking or such operations. To say that we should try to handle our squint cases early seems so obvious as to be hardly worth repeating, but though we have been hearing this taught for some time, most of us still see these cases much later than we would like to see them. There are still too many people, both medical and non-medical, who are inclined to wait a few years to see what will happen and all too often these few years extend into far too many years.

Dr. Lawrence T. Post, St. Louis, Mo.—I am in complete accord with Dr. Wilkinson in believing that concomitant strabismus should be treated early and methodically. For the baby in whom strabismus appears, observation with the ophthalmoscope after dilatation of the eye is the first procedure. If no pathology other than hypermetropia is found, atropinization of both eyes in alternating cases or of the fixating eye in monocular cases, may be tried. If this is ineffective, as is usually true, occlusion of the fixating eye is necessary. Glasses should be prescribed as early as they can be worn if ophthalmoscopic measurement indicates a large hypermetropic error. I have had no success with glasses in babies under one year of age.

I do not think that it is always possible to determine the etiology of strabismus. I am a firm believer in the value of the prism cover test, but in my own hands it is not satisfactory as early as the age of 2 years. The accommodative type of strabismus is the most amenable to treatment. In cases in which squint begins within the first year, results are apt to be discouraging, as abnormal retinal correspondence is almost certain to exist. If the angle of deviation in spite of glasses, when they are indicated, is greater than approximately 20 degrees, orthoptic treatments are usually unsuccessful. In my hands, orthoptic treatment under the age of 6 has rarely proven worth the effort required. A vision of not less than 20/40 in the worse eye is almost a requisite. The successful cases are those in which, at some earlier period, the child has had straight eyes and the beginning of fusion development. In those who have never had straight eyes, some fundamental underlying difficulty which will almost always interfere with fusion exists. Success depends not only on the small angle of squint, but on the percentage of time in the life of the child that the eyes have crossed and also on the time that has elapsed since the strabismus began.

I advise surgery in cases of squint of over 20 degrees if, after a few preliminary orthoptic efforts, no improvement is noted. Orthoptics are often valuable postoperatively. It is very important that surgery should be such that no considerable hypertropia results, as this is usually a serious handicap to fusion training. It often exists preoperatively as an important contributory cause of the squint, as pointed out by the essayist. Before surgery, attempts should be made to determine whether there is an over-activity of convergence or an underactivity of divergence. If this knowledge is obtained and the surgery directed to overcoming the muscular abnormality, which is agreed to be fundamentally innervational in these cases of concomitant strabismus, the type of operation is relatively unimportant. For example, a convergent strabismus with a relatively distant near point of convergence should not have a recession of the interni, but should have advancement of the externi.

We have conducted an orthoptic clinic in Washington University for almost ten years. It is of great diagnostic value and very important for determining the character of operation indicated and frequently for postoperative training. Orthoptics are useful in cases with normal retinal correspondence, but we have had very little success in overcoming abnormal retinal correspondence.

The essayist has brought again to our attention many of the important points in the management of strabismus. They cannot be overstressed. Even more important is the continued dissemination of the knowledge on this subject to those outside of our specialty.

Dr. Wilkinson (closing).—Dr. Wells, of Boston, who has been an advocate of the very early treatment of

squint for a number of years, remarks that from 25 to 30 per cent of his cases are seen after they have been cross-eyed at least five years. Bishop Harmon, of London, reports that from 50 to 65 per cent of his cases are seen after they have been cross-eyed five years.

Dr. Post suggested that the matter of education of the general practitioner and of the pediatrician to the importance of early care of these cases cannot be overstressed.

In a recent report from the orthoptic clinic of Northwestern University only 1 per cent of the cases were relieved by the use of glasses alone, and in a second series not even 1 per cent were so relieved. That has not been my experience, and I believe that if we see these cases early that it will not be your experience.

As to the early operative procedure and the beneficial effects of early operative procedure, any child 2 years of age who has sufficient deviation to keep that eye from working with the other eye at all times is certain to develop either suppression or abnormal retinal correspondence, or both, if we do not do something about it. Dr. Chavasse and others have maintained that if we do something to straighten those eyes and place them nearly parallel by an operative procedure, even at 2 years of age, or younger (he operates earlier), it gives the child a chance to develop that innate desire for binocular vision, or as some have put it, it gives him an opportunity to avoid diplopia, which he dislikes very much. In other words, I have seen, within the last two months, two patients upon whom I operated some twelve years ago. I operated upon them when they were about three years old. They had marked deviations of something like 30 arc degrees. I had not seen either one of them for some five years. Both had binocular vision and depth perception. They had no orthoptic training; nothing was done except that the eyes were set straight and they went home to their parents and developed normally.

An eye that is deviated is going to develop a false fixation or suppression, and every minute that the eye is deviated you are losing the opportunity to permit nature to straighten the child's eye itself.

A RESUME OF CONSERVATIVE SINUS MANAGEMENT*

By J. HALLOCK MOORE, B.S., M.D.
Huntington, West Virginia

This paper deals only with the acute and subacute phases of sinusitis, the chronic stage which has not advanced to the point of imperative operation, and cases in which allergy has been definitely ruled out. Its purpose is to attempt to evaluate the respective modes of treatment, and to lessen the confusion concerning this disease in lay and medical minds.

*Read in Section on Ophthalmology and Otolaryngology, Southern Medical Association, Thirty-Fourth Annual Meeting, Louisville, Kentucky, November 12-15, 1940.

An important factor which the rhinologists overlook is that if given sufficient time the majority of infected sinuses will cure themselves. We treat sinuses to hasten their recovery, to prevent chronic pathologic changes, and to lessen the number of operations, which are too frequently unsatisfactory, but which must be performed when pathologic changes exist. Hence, any therapeutic method that assists nature in establishing adequate drainage and re-establishing a normal airway will have merit. As it is impossible to differentiate a sinusitis which will undergo spontaneous resolution from one which will become chronic, some mode of conservative therapy is necessary.

The anatomy, etiology, pathology, symptoms, diagnosis and prognosis are outside the field of this paper except insofar as they are encountered in the therapy of the disease. Concerning these a few words must be said to refresh certain factors in our minds.

From an anatomical standpoint,[1] children's sinuses are, with very few exceptions, amenable to treatment. This is due to the viability of their tissues and the size of the sinuses. In adults, the anatomy of involved sinuses which do not respond to a rational therapy must be studied.

It is agreed that the commonest etiologic factor in sinus disease is a nasal obstruction. Our knowledge of the exact physiology of the sinuses is still in an embryonal state; but most observers admit that they undoubtedly are part of the air-conditioning system of the respiratory tract. Hence, any impairment of the nasal airway, be it either mechanical, allergic, the common cold, or traumatic, must be corrected before the normal physiology of the sinus is re-established. The adenoids have proven to be the chief obstructive factor in children, and allergy holds the unquestioned second position. Both of the above render the access of the invading organism easier. Coryza is the commonest form of transient nasal obstruction, and unless an ample airway is maintained not infrequently sinusitis results. The latter brings its bacterial invaders with it and lowers the resistance of the individual to them.

Pathologically[1] the sinus membrane, which is normally about 0.1 mm. thick, undergoes changes which are first a hypertrophy following a hyperemia. This in time is succeeded by a hydropic condition which transforms itself into a myxomatous state. From this stage fibrosis occurs.

Ciliary action is impaired throughout and with the onset of the fibrosis is greatly diminished.

The chief symptoms of sinus disease are loss of energy and listlessness. Usually there is a slight chronic cough, worse in the mornings, and about one patient in ten has pain. The latter is confined chiefly to the acute case. There may be a slight temperature of about 99 to 100°.

Many of these cases are kept in bed with the diagnosis of "flu." They are sometimes treated for these maladies too long before the rhinologist is given a chance to clear them up. The acute sinus usually calls attention to itself and is less likely to be missed by the general practitioner. Of course, x-rays and transilluminations would rule out the majority of such cases. The rhinologist must educate the general practitioner to this necessity.

The prognosis in sinus disease is today better than it ever was before. The country is sinus conscious and by conservative means of therapy sinus operations are becoming less necessary. This is not a condemnation of sinus surgery, but if it can be prevented so much the better.

Conservative therapy of sinus disease consists of shrinkage of the nasal mucous membranes, stimulation of the patient's resistance, drainage by any method, and adjuvants to nature such as the application of heat, response of the membrane of the sinus to the roentgen reaction, and diathermy. All authorities today condemn suction in excess of 180 mm. of mercury pressure, as the resulting hyperemia defeats the treatment. Irritants in the nose which were used by the counterirritant school, likewise, defeat their aim by the excessive reaction and deleterious results which follow their use.

In acute sinusitis Furstenburg[2] advocates a conscientious neglect of any surgical procedures to increase drainage until the acute phase subsides. Pain is controlled by morphine and codeine, and shrinkage is obtained by 3 per cent aqueous ephedrine solution dropped into the nose with the head in the Proetz position.

Nasal shrinkage in sinusitis is of great importance, as it assists in starting and maintaining drainage from infected sinus cavities. Any of the legion of vasoconstrictors upon the market will accomplish this. However, in utilizing these, three factors must be borne in mind. (1) It must not be irritating as the reaction following its use will defeat the aim of its application. (2) It should be isotonic. (3) It must not inhibit ciliary action.

Cocaine in a weak solution of saline meets these demands, but in chronic cases or where the patient is subject to many colds, its habit-forming properties make it undesirable. Ephedrine in saline about 1.5 per cent in strength meets the above requirements nicely, and if coupled with some of the mild silver salts has a decided healing action. In my private practice I use a stable mild silver preparation constantly and have never had a case of argyria. These undoubtedly occur, as I have seen them, but they are rare.

The benzedrine inhaler is an excellent vasoconstrictor and unless overindulged in, it may be used conveniently for long periods without deleterious results.

The majority of rhinologists look with undue disdain upon the silver protein tampon. This, in my practice, has been a valuable adjunct to sinus therapy and assists materially by its hydroscopic action in removing mucin[2] from the nares. My method is to employ a larger tampon than Dowling[3] advocates, and to the silver protein preparation I add a mixture of equal parts of 3 per cent ephedrine and 2 per cent larocaine, which accomplishes shrinkage as well as relieves the patient's discomfort from the silver salt alone. After the pack is removed, the nares are irrigated with normal saline. An antral irrigation after such a procedure demonstrates silver in the irrigant, proving that it penetrates into the sinus, even without suction as used in displacement. To date, after over nine years of practice and several thousand patients treated by this method, I have yet to have my first case of argyria.

Most patients with sinus disease have a definitely lowered resistance. This is a phase of the problem of sinusitis which is frequently overlooked by the rhinologist. Many cases of sinus disease fail to undergo resolution and healing simply because the individual is practically immune to the low grade infection in his sinuses. Such patients respond nicely to the stock antigens, or in stubborn cases to an autogenous vaccine aseptically taken from their own sinus irrigant. The dosage of all these should be very small at the initial injection. Stock preparations may be used, starting in the region of 0.5 c. c. and increasing by 0.5 c. c. each dose. The autogenous vaccine should be started at about 0.05 c. c. and increased until untoward symptoms set in.

The late Dr. R. T. Atkins, of New York City, early impressed upon my mind the necessity of

drainage of the sinus cavities, even in their acute phases. This concept has not been overruled in my experience, and as time goes on I find it a more sound dictum. Drainage of the sinuses can be accomplished by several methods: (1) puncture, (2) displacement and (3) irrigation, via the natural orifice.

The original method of draining a sinus was by the puncture route via the inferior meatus. This was accomplished by the Coakley punch, the Lichtwicz needle, the Woodward punch, or some other modification thereof. Unquestionably these methods permit excellent evacuation of the sinus contents by through-and-through irrigation, but there is always the hazard of causing a spicule of bone to be loosened and to sequestrate into the sinus cavity. This may also give rise to an osteomyelitis of the maxilla. Hence, for conservatism, these methods should be condemned where other less traumatic procedures can supplant them.

By the displacement method of evacuating a sinus contents, Proetz[4] has evolved an ingenious manner of treating and studying the physiologic action of sinus membranes and the results of their pathologic changes. His recommendations concerning diagnostic x-ray with the horizontal beam are excellent, and, undoubtedly, the displacement method renders an effective non-traumatic method of drainage. Practically, however, the cost of two sets of x-rays and the duration of the treatment place this mode of sinus therapy behind that of irrigation via the middle meatus. Proetz clearly points this out in his text.

Dr. W. C. Bowers,[5] of New York City, working under the late Dr. Coakley, designed a method of sinus irrigation which is simple, non-traumatic and practically as efficacious as the puncture method. This was not new to Dr. Bowers, as Yankauer and others had treated sinuses via the middle meatus, and many still follow their dictates. However, Bowers invented a cannula which is simple to use and which easily enters the natural ostium of the sinus in more than 85 per cent of cases when the antrum is irrigated. Simons[6] says that the canal or ostium of the sinus deviated posteriorly in 56 per cent of 102 subjects studied at postmortem. However, to explain my 85 per cent I wish to point out that the ostium of the maxillary sinus is in the unprotected portion of the lateral nasal wall, and that if a malleable catheter is inserted into its os there is no reason why the membranes should not allow even the anteriorly directed canals to deviate posteriorly upon pressure. Please remember there is little or no bone in the unprotected area of the nasal wall. The other 15 per cent have been easily punctured with little or no discomfort or untoward results. In the past nine years I have irrigated approximately fifteen thousand antra, in ten thousand individual patients, and in only three instances have I had to use other than the middle meatal route. In two of these cases I chose it in preference to the middle meatus because of pain. This method can be applied to many frontals and sphenoids with equal ease, but Proetz definitely proves his advantage in the ethmoidal areas.

An adjuvant to sinus therapy is the application of heat to the sinuses, which definitely renders the patient more comfortable. Short wave diathermy, as Hollander[7] states, commonly supplies this and is not a cure-all, as many general practitioners believed at one time. Diathermy plus conservative sinus therapy can accomplish something if the diathermist and rhinologist work together, but diathermy alone is not a treatment of sinusitis. The infra-red ray has proven to be of definite value. Thermopiles in the antra have shown that the intra-antral temperature is raised by the infra-red ray, and unquestionably diathermy does only this. In our hands the Dowling pack plus the infra-red ray have cleared up many cases of coryza and ethmoiditis. However, I believe diathermy and the infra-red ray may be used interchangeably in sinus therapy without loss to the patient, and infra-red heat is much more economical.

The effect of roentgen rays upon diseased sinuses is still in the early stages of experimentation, except in the hands of a certain few radiologists. Dr. Hodges[8] advocates it in selected cases, especially children. As I have already pointed out, children's sinuses are readily treated by any means, in which Dr. Hodges concurs, and if the adenoids are removed the sinuses will frequently clear up under simple nose drops. For these reasons it is to be questioned whether the sinuses would subside under conservative management without x-rays. Dr. Gatewood[9] prefers this method, for children's pituitary glands are in the field of the rays, and he suggests that it would be better if they were not subjected to irradiation. Of course, x-rays will reduce in size adenoid tissue, and in chronic sinusitis will give the lymphoid destruction reaction which is beneficial.[8] [10] In selected sinus cases I have tried x-ray therapy, but to date no definite results from the roentgen ray have been observed. However, I feel that the surface of

this field has just been scratched and by a close cooperation between the rhinologist and x-ray therapist irradiation therapy's exact value can be worked out.

Chemotherapy is of distinct value in sinusitis. Most sinus infections are due to the staphylococcus, streptococcus and pneumococcus. Any of the sulfonamide group of drugs will materially assist in killing these bacteria. Bowers[5] prefers sulfathiazole, and my own observations point to less toxicity from this derivative of sulfanilamide than from the others. However, it must be borne in mind that sulfathiazole is not absorbed into the spinal fluid, and for this reason is less valuable if an intracranial complication is feared.

In dealing with my own cases I follow the following routine. In the very acute stage the patient is confined in bed and the nares are kept open as well as possible by silver protein solutions and ephedrine packs and drops. Fluids are forced and general supportive measures are resorted to. Irrigations via the middle meatus of the antra are started on the second or third day, depending upon the extent of the edema of the turbinates. These are continued either daily, every other day, or less frequently, depending upon the case. The irrigating solution is normal saline. If sinuses other than the antra are involved, as they are frequently, they are washed, if possible, via their ducts and ostia, but a longer delay is necessary when irrigating the frontal. Drainage is stimulated prior to the irrigations by astringents and shrinkage of the nares and middle turbinates. Usually after the third antral irrigation the patient becomes ambulatory, and in the office the Dowling pack replaces the silver and ephedrine one. The above treatment is carried on until the sinuses return a clear irrigant and after one week they are checked by another wash. If this is negative, the patient is discharged.

Under this management my radical sinus surgery has been kept at a minimum, and I find that patients so treated are no more susceptible to sinus disease than they were before the initial infection. Many of these cases have gone from three to five years without a recurrence.

Chronic cases, especially of the antra, should be irrigated for over a period of four to six weeks before surgery upon the sinus *per se* is even contemplated. Here the bodily resistance is low, and chemo- and vaccine therapy play a leading role. Of course, all nasal deformities must be corrected and allergy definitely ruled out. With these steps many sinuses will reduce themselves to a minimal stage of infection, and if x-ray therapy does not help them, a permanent opening will usually suffice. Whereas, without the above routine a more radical operation would have been necessary.

The other methods of therapy outlined above would undoubtedly accomplish these results, but the simpler, easier and less painful method is preferable. Antral irrigation is the key to the entire sinus problem and Bowers[5] has definitely proven that many a stubborn case of pansinusitis has cleared up with only this means of treatment. In other words, the antrum is the keystone of the sinus arch. Dr. Woodward[11] has adopted this method of treatment and feels that his results are much better than formerly.

CONCLUSIONS

In conclusion, there are several pertinent points to be borne in mind.

(1) The majority of all diseased sinuses would cure themselves if left alone for a sufficient period. Hence, any method of assisting nature in sinusitis will have merit, but undue stress cannot be laid on any one method.

(2) Children's sinuses, owing to their size and the viability of their membranes, are particularly amenable to treatment. Hence, undue conclusions as to the value of therapy should not be drawn from observations upon treatment of children's sinuses.

(3) X-ray therapy of sinusitis is still in an experimental stage and therefore is of little known value today. However, research in this field is being done in which the roentgenologist and rhinologist should work in close harmony.

(4) Diathermy, by either the long or short wave, is of no more value than the infra-red ray or heat in any other form.

(5) Irrigations from a practical standpoint, except in case of an ethmoidal involvement, are quicker, easier and less expensive than the displacement method.

(6) The silver protein tampon as advocated by Dowling is still of definite value in removing mucin from the nasal tissues and has been too hastily discarded by many rhinologists.

(7) To clear up the sinus problem thoroughly a competent study of the entire question should be completed by either a congress of rhinologists or through the formation of a society of rhinologists similar to the American Laryngological or Otological societies. Such an organization should

combat the fallacies and direct research in the sinus field.

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DISCUSSION (*Abstract*)

Papers of Dr. J. Hallock Moore and Dr. Bernard J. McMahon (Paper of Dr. McMahon, "Abuses of Nasal Medication," appeared in the May issue, page 524).

Dr. William A. Wagner, New Orleans, La.—We do not see these patients in the first stage of acute rhinosinusitis when the nose is dry and irritated, but frequently in the second stage when the nose is running and filled with mucus. It has been my practice to prescribe for them small doses of atropine. I use a dose of about 1/300 of a grain. I believe larger doses than that may overdry the nose and predispose to glaucoma; but 1/300 of a grain has never so much as dilated a pupil and is sufficient to eliminate the excessive flow of mucus. It is that excess mucus that we have to get rid of. Furstenberg and Nungester have proven that mucus increases the virulence of the organisms and Hilding and Proetz have shown that it inhibits the physiologic function of cilia. Therefore, that stage is the only stage in which I prescribe atropine in small doses. In the third or purulent stage the secreting serous and mucous glands flood the nasal and sinal cavities and therefore thin out the thick tenacious pus, and nasal astringents should be administered. I believe that astringents open the ostia and meatuses and hasten recovery or favor a resolution.

If the proper medicant is used, one that is a sympathetic stimulant that will not only produce stimulation of the cilia and help move the mucus on the surface, but will stimulate the glands to secrete more serum and consequently more lysozym, nature's antiseptic, we will increase the tendency toward a normal nose.

If we have a patient with a bad heart, we should not prescribe large solutions of ephedrine. We should use weaker solutions of ephedrine, or a drug with less effect upon the heart and circulatory system.

In selected cases where material in the nose is tenacious and thick and has accumulated in masses in the nasal spaces, we must remove that material by irrigation. I do not argue with the man who chooses to use irrigations, but let him use a normal, physiologic saline solution, not an antiseptic.

At times we are forced to irrigate the sinuses to get rid of the accumulated pus that nature cannot remove. We recognize the fact that the cilia are resistant, but only to a certain degree. When the limitation is reached the cilia no longer can clean the antrum lumen, and we must help nature, and I know of no better solution than saline.

I do not condemn Proetz's displacement method. I like it and use it; so do I use Parkinson's method. They both have their value, but they are at a disadvantage in the antrum, the sphenoid and the frontal. They are useful in the ethmoid. There again we must apply the method to the particular case.

As to the application of heat in acute cases, I believe that if what Profant tells us, that the mucus in the nose is normally acid with a pH of about 5.4 and that during acute infections it becomes alkaline to a stage of about pH 8.5, then our tendency toward the application of heat, which he has proven will acidify the nose, may be timely. However, we defeat our physiologic purpose in therapy by the administration of heat, because heat favors turgescence and obstructs the ostia, and thereby interferes with physiologic drainage. Therefore, I cannot quite agree yet and satisfy myself that heat in the form of infra red ray, or what-not, is suitable.

I have discontinued the use of silver preparations and packs. I believe that a silver pack opens the nose only by the antidromic reflex of Bayliss.

The more physiologic method of shrinking the nose is by stimulating the sympathetic nerves, and for that reason I select a sympathetic stimulant such as ephedrine. I do not fatigue the neuromuscular junctions and am not worried about the irritating effects at that junction which follow shrinking the mucosa. One can put a dry cotton applicator in the nose and shrink it; that is exactly what the pack does whether it contains silver or not. It denudes the ciliated epithelia, and those of you who have seen ciliated epithelium function do not want to irritate it. Consequently, I do not believe that the introduction of packs is beneficial.

Secondly, you cannot get the packs back into the olfactory region very readily without excessive trauma. It is impossible to get them under the middle turbinate in many instances, and it is impossible to get them back into the spheno-ethmoid recess where they might render their best service.

I believe that a fine cotton applicator after shrinking the nose in the floor by spraying should be used, and it should be used gently. Nobody can apply medicants back in that region with a large applicator. The smaller, the better.

Dr. A. L. Bass, Louisville, Ky.—I long ago decided not to be the first to discard the old, nor the first to try the new remedy. I have often wished that an unbiased committee could pass on the value of a remedy before it is dispensed to the physician.

I have tried most new things on myself before using them on the patient, and often the remedy has never reached the patient.

Not long ago a physician from out of the state turned

his practice over to a colleague and came to me with the statement: "You will have to do a Caldwell-Luc on me; I have made arrangements to stay as long as you want me to." He had had an acute rhinopharyngitis two weeks before, and he had been using 3 per cent ephedrine hydrochloride solution in his nose several times per day. His sinuses transilluminated clear, but I had to have them x-rayed in order to convince him that they were negative. After leaving off the ephedrine solution, he returned home within four days, well. I do not use ephedrine hydrochloride stronger than 1 per cent and not over two or three times per day. It should not be used unless indicated.

More than once my judgment has forbidden me even to try highly recommended new remedies. Experience and time have borne me out. Two of the remedies Dr. McMahon has mentioned, namely: chlorine gas and zinc ionization.

Not only should we know what to use for medication, but when not to use it. For example: never use saline or any other douche in acute coryza. It is one of the worst things to do. I have seen pansinusitis follow warm normal saline douches. Too much medication in most instances is worse than not enough. Do not irrigate an acute sinus; give nature a chance.

It is best not to tell the patient that you are using cocaine if you can avoid it. Tell him that you are using butyn or procaine. It is more satisfactory for all concerned. Then, as Dr. McMahon said, do not abuse its use.

The colloids of silver are to be reckoned with. I tell the patient that the solution should be fresh, not to use a solution over two weeks old, and to throw it away, not to keep on using it. In spite of this some of them have the druggist refill the prescription and treat themselves, and do not return to the physician for months.

I recently saw a woman patient for whom I had prescribed a 15 per cent silver salt earlier. Without returning to me she had used it steadily since. I think she was proud of the conjunctival argyria she had, as it gave her a good make-up.

I wish to emphasize Dr. McMahon's conclusions: cocaine and silver preparations and irrigations should be used in the nose with the greatest care. Self-medication for laymen should be discouraged, and home medication carefully controlled. New remedies should be accepted by the medical profession only after scientific proof of the efficiency and the inability to damage the nasal mucosa.

Dr. J. W. Jervey, Jr., Greenville, S. C.—What I have to say will certainly be in the nature of friendly criticism. I envy Dr. Moore in having a practice wherein he has found it desirable or even possible to do as many as five to six antrum irrigations daily. Frankly, I see so much less than that, that it is inconceivable to me that the occasion could arise.

In that connection I have one or two suggestions to make which I think if followed out would probably result in fewer antrum irrigations.

I have mentioned several times a method which has aided me considerably in making my clinical diagnosis of antrum infection with particular reference to the acute and subacute cases.

If in case of an acute antrum, you will transilluminate not once but a second time after the mucous membrane has been shrunken with a vasoconstrictor, and it matters not in the least what type of vasoconstrictor you use, you will often find that what appeared to be a cloudy antrum, even a black antrum, will within three to five minutes clear with astonishing rapidity to such an extent that had you shrunk the membrane before transillumination, you would not have been able to detect that anything was wrong.

Only last night a gentleman of our section made the unqualified assertion to me that transillumination was of no diagnostic value, a very narrow-minded confession. I told him that he did not know how to transilluminate an antrum.

I have not had the good fortune to be able to irrigate 85 per cent of my antrums through the natural opening. I tried for some time, and found that I was able to get in only about 50 per cent, and then sometimes with what I felt was a little more trauma than necessary, in the neighborhood of the natural opening. I, therefore, rarely resort to it, and for one other reason. At least once I have had it happen to me in irrigating an antrum through the natural ostium that the sinus sound was present, I was convinced that I was in the antrum, but no pus resulted on irrigation. Yet I was satisfied that pus was there, and on puncture through the inferior meatus, lo and behold, the pus was there. So that is an additional reason for being careful in drawing conclusions.

I should like to add an observation of mine in the case of a very well-to-do family at home, whose mother, certainly not for financial reasons, kept up home medication, using silver drops in the nose over a period of years. She has one boy who is definitely suffering from an argyrosis, and another one who is incipient.

I think Vick's drops might well be called "victims' drops."

Dr. Harvey B. Searcy, Tuscaloosa, Ala.—I use plugs saturated with silver protein or magnesium sulphate, according to the case. I use a small plug, and place it in the ostium I desire to treat. A small plug placed in the middle meatus, well saturated with the solution, and then a suction tip applied to the anterior end of that cotton plug by capillary traction will evacuate the sinus very effectively. The cotton will become saturated with pus from the sinuses. If I remove the suction, wait a minute and push it back again, I form a vacuum in the sinus.

I always locate the antrum with a small probe, because I think it takes less time and is less painful to the patient. After I find the natural ostium, I use considerable pressure pushing the probe against the lower turbinate. The lower turbinate will pit, and I have a groove that is pitted across the lower turbinate to follow as a guide in finding the ostium with a cannula. If, after I put my cannula in, I find it takes too much pressure to evacuate the antrum, I slip my meatus knife into the natural orifice and cut the membrane so that I can evacuate the antrum without much pressure.

I wish to emphasize the dental etiology in many of these cases. I also wish to impress you with the importance of diet in any chronic infection, and the avoidance of sugar.

Dr. John J. Shea, Memphis, Tenn.—Of late we are

being reminded of the disturbances of the physiology of the nose by medication. The patient does not present a normal nose and many of the conclusions presented are wrong.

Dr. Moore overlooked telling us his medical treatment. Rest in bed is the best treatment for an acute sinusitis. Chemotherapy is of value in the severe cases. Why does a patient get an acute sinus? He gets an acute sinus because the ostium of the sinus blocks and his resistance is lowered.

I prefer to irrigate through the natural ostium of either the frontal or maxillary sinus and sometimes the sphenoidal. Seldom is it necessary to puncture and an assortment of irrigators is necessary and one must practice their use. The antrum will do better if the natural ostium is dilated.

The proper method of instilling oily solution into the nose is with a syringe posteriorly. The oil escapes anteriorly, thus removing the risk of its going into the lungs.

The nasopharynx is deserving of treatment in all patients suffering from sinusitis.

Dr. Coffman, who popularized "displacement," and who, unfortunately, never received the proper recognition, advised that we use anterior displacement in the acute cases and reserve for the treatment of chronic cases posterior displacement.

Dr. W. R. McKenzie, Baltimore, Md.—I want to issue a few words of warning about some things not to do for acute and chronic sinusitis.

There is a great deal of discussion at the present as to whether x-ray therapy is of value. Some x-ray men will tell you that it is a cure-all and that almost all of their cases get well and remain well. Some x-ray men equally good will tell you that it is practically without value. Whether it is with or without value, it leaves a great many harmful effects if the patient gets sufficient x-ray therapy for a possible cure. In the first place, the function of the parotid and submaxillary glands is greatly attenuated by the use of x-ray, so that the patient has a dry throat and mouth. In the second place, the nasal mucous membrane and submucosa undergo a certain amount of fibrosis from the x-ray therapy, so the patient is left with a secondary atrophic rhinitis.

I have seen quite a number of patients who had x-ray therapy before consulting me. The reason for consultation with me was to get rid of the dryness from which they were suffering following x-ray therapy.

Another thing is the indi criminate use of ephedrine, and, as Dr. McMahon brought out, the self-medication of patients with ephedrine drops. The action of ephedrine is to produce a vasoconstriction. After the patient uses it once or twice and gets the soothing sensation of increased respiration through the shrunken nose, he will continue to use it as soon as the swelling recurs. This keeps the blood vessel walls in a state of chronic constriction and if this medication is continued for any length of time, paresis of the blood vessel walls ensues, with a resulting vasodilatation, swollen turbinates and nasal mucous membrane, resembling vasomotor rhinitis. From this condition the patient can get no relief, except by the discontinuance of the ephedrine solution.

While epinephrine, ephedrine and various other vasoconstrictors are very beneficial and necessary drugs in the treatment of various rhinologic conditions, they should be used only by the otolaryngologist. They should not be given to the patient because of the dangers of self-medication.

Dr. Jos. D. Heitger, Louisville, Ky.—The essayist limits his thesis to the acute and subacute phases of nasal sinusitis, the chronic types which have not advanced to the stage of imperative operation, and non-allergic types of sinusitis.

This classification might lay him open to the criticism of a certain vagueness and lack of specificity.

In the treatment of nasal sinusitis one of the first essentials is, in so far as is possible, an exact diagnosis of surgical and non-surgical types of pathologic lesions present in the mucosa of both the nose and sinuses. This further implies an accurate knowledge of the physiology of the nose and sinuses, in so far as is known, in order not to mistake symptoms due to disturbed physiology or changes in the adaptive mechanisms of the nose and sinuses from environmental effects for those due to pathologic changes. In other words, one must always be careful and not confuse symptoms of pathologic physiology and pathologic anatomy. Pathologic physiology is as frequently reversible as pathologic anatomy is irreversible. The lack of precise histopathologic knowledge often leads to the indiscriminate removal of tissues essential to the nose and accessory sinuses, thereby producing a striking array of contradictory results.

The adoption of the above fundamental principles will necessarily discard the use of the words "conservative" and "radical" and constructively substitute the more specific terms of adequate, complete and logical.

In regard to the acute phases of sinusitis, it is rare to find an acute sinusitis that does not recover when adequate drainage is maintained. Therapy should be directed toward patency of the sinus ostia, and not toward treatment of the nasal structures, as is frequently done. I cannot agree with the essayist's lavage treatment. In acute sinusitis lavage is not wise before the end of the first week, or later. Early puncture and lavage, before the local defense mechanisms residing mainly in the reticulo-endothelial system have time to become active, are dangerous and may be the cause of a spreading osteomyelitis. Lillie has proven that the use of watery solutions in the sinuses not only prolongs discharge, but also produces it. The nose and sinuses may be more adequately drained by cannula, not mass suction, after thorough shrinkage of the mucosa about the sinus ostia. Mass suction always presents the danger of herniation of the sinus mucosa into the ostium of the sinus, with hemorrhage into the mucosa and blocking of the lymphatic system draining the sinus.

Displacement is not suited for the acute cases, but gives much better results in the late stages of the subacute and chronic types of sinusitis.

When we are confronted with a case of chronic sinusitis we must ask ourselves the question, "Why has this sinusitis become chronic?" The answer to that question, derived from a good history and adequate examination, will often supply a solution to the problem of treatment. There are, of course, cases in which the cause of the chronicity is obscure.

The basic pathologic changes are few in number, namely: exudation, infiltration, proliferation and de-

generation. Exudation, infiltration and mild degrees of proliferation are reversible, whereas severe degrees of proliferation and degeneration are irreversible. The reversible inflammatory changes are amenable to non-surgical measures, whereas the degenerative changes are subject to surgical measures. The operator, to be successful, must accomplish in the operating room what frequently is attempted pre- and postoperatively in the office.

The normal sinus mucosa is 0.1 mm. thick, or about the thickness of a cigarette paper.

THE ATOPIC FACTOR IN URTICARIA*

By BOEN SWINNY, M.D.
San Antonio, Texas

I should like to introduce this study of the atopic factor in urticaria by quoting the opening paragraph of Dr. John H. Stokes[1] before the Section on Dermatology of the American Medical Association last June:

"* * * It should be insistently reiterated that cause and remedial procedure in disease are to be thought of as complex and multiple rather than simple and sole. The psychoneurogenous, like the focal infective, the bacterial, the toxic, the traumatic, rarely seems to act alone. It is part of an interplay; an affair of predispositions and excitants, of broadening and narrowing influence as one or another element approaches, recedes, collides, combines with other factors in the causal complex. Among the newest of the new factors elbowing their way into place in the thinking of the analyst of disease causation is the psychosomatic concept of the 'total personality.' This discussion is an attempt to place the personality of the neurodermitic in some definitive relation to his skin's behavior; again, not as a sole cause of his trouble, but as a factor acting in a complex of hereditary, physiologic, allergic, bacteriologic, immunologic and other pathogenic and protective-reactive agencies * * *."

One finds in scanning the general literature approximately two dozen etiologic factors in urticaria. Among allergists there appears to be some variation of opinion as to the relative part played by allergy and other factors. This has been evidenced before this Section by two papers, namely: that of Vaughan[2] at the New Orleans meeting in 1937, who presented a series of cases wherein the emphasis was on the psychogenic factor; and that of Kahn[3] at the Memphis meeting in 1939, who reported the successful outcome of seventeen of eighteen consecutive cases of urticaria treated by allergic means alone. These two presentations (and my personal experience of failure in general of the allergic approach) inspired this attempt to determine the role played by hypersensitiveness in urticaria.

On the whole, the mass of literature proved of little assistance in this determination as comprehensive papers were in the minority. The great majority presented a single factor without evaluation of other possible factors. As an example, the recent report of Rosenberg,[4] who showed a serum cevitamic acid deficiency in seven patients, all relieved by the liberal use of citrus fruits. Among the more comprehensive that give an indication of the relative importance of atopy are the following:

Brown,[5] in 1929, presented a study of 160 patients in which he called attention to the close relationship between urticaria, angioneurotic edema, bronchial asthma and hay fever and noted that, in general, significant skin tests in urticaria are infrequent. In his opinion his high percentage (60) of positive reactions were related more to a concomitant asthma or hay fever than to the urticaria. Fink and Gay,[6] in 1934, presented one of the most enlightening reports in which they studied 170 cases and classified them as infectious, allergic, psychogenic, endocrine and undetermined. They found 20 per cent due to hypersensitiveness, basing this diagnosis not upon skin tests, but upon the clinical effect of the excitants. These authors stressed the fact that a high percentage of the patients relieved by allergic means had a high incidence of other personal allergy. Stokes[7] and others in 1935 studied 100 cases from an etiologic approach that included focal infection, the emotions, allergy and gastro-intestinal dysfunction. They mentioned the importance of a history of other allergy as being significant in their hypersensitive cases. Their conclusion was that "Attention to several factors in a case rather than to one alone increases the proportion of good results," and "that dogmatic assertion as to sole causes is to be deprecated." They found that the exclusion of substances to which the patient gave a positive reaction (scratch test) and an elimination diet were conspicuously unsuccessful as therapeutic measures. Cohen[8] recently announced his discouragement in his effort to handle urticaria from the allergic approach except in patients who had other evidence of allergy. Coca[9] early mentioned that urticaria is often dependent upon some mechanism other than the atopen-reagin mechanism and where this is present it is usually in patients with other allergic manifestations. Sulzberger[10]

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*Read in Section on Allergy, Southern Medical Association, Thirty-Fourth Annual Meeting, Louisville, Kentucky, November 12-15, 1940.

mentions on several occasions the strawberry rash as being characteristic of urticaria in which no reagins are demonstrable.

I could find in the literature no study of urticaria based upon a population survey such as had been done with asthma and hay fever. Instead of attempting to evaluate the factor of atopy by an analysis of my own cases, I decided that a comparison of the incidence of urticaria in atopic and non-atopic groups might add to our knowledge of this factor. For obvious reasons asthma and hay fever are used as indicators of the existence of atopy.

In the course of this investigation 581 persons with a chief complaint of asthma or hay fever and 1,000 non-patients were interviewed with regard to whether or not they had had urticaria, the number of their attacks, the probable excitant, and whether or not they had to seek medical aid. In order to equalize the error of memory, all patients with a chief complaint of urticaria were excluded. The non-patients were chosen in age groups and sex distribution similar to the patient group. The following data were obtained:

INCIDENCE OF HAY FEVER AND ASTHMA

Total persons (non-patients) interviewed	1000
With personal history of AHF	42
Incidence, per cent	4.2

Table 1

URTICARIA IN THE NON-AHF GROUP

Total persons with negative personal and family history of AHF	958
Who had had urticaria	214
Incidence, per cent	22.3

Table 2

URTICARIA IN THE AHF GROUP

Total persons with positive personal history	633
Who had had urticaria	335
Incidence, per cent	52.9

This includes office patients plus the 42 non-patients.

Table 3

RATIO OF AHF TO NON-AHF GROUP

Urticaria in AHF group, per cent	52.9
Urticaria in non-AHF group, per cent	22.3
Ratio of positive to negative	2.33:1

Table 4

POPULATION INCIDENCE OF URTICARIA

AHF	Non-AHF
4.2 per cent	95.8 per cent
Urticaria	Urticaria
52.9 per cent	22.3 per cent
2.22 per cent	21.4 per cent
Ratio 1:9.7	

Table 5

URTICARIA PATIENTS SELF-CURED*

Asthma-hay fever group, per cent	61.5
Non-asthma-hay fever group, per cent	77.1

*Self-cured, spontaneously relieved or relieved by simple home remedies without consultation with a physician.

Table 6

DISCUSSION

Actually such a group of figures as the above proves nothing. The error in the application of the findings in a small group to broad populations is obvious and readily admitted. Probably the most accurate information here obtained is that urticaria occurred nearly 2½ times as frequently in an asthma-hay fever group as in a non-asthma-hay fever group.

Also, one might note that the ease of "cure" is about the same in the one group as in the other. A better division would have been into "acute" and "chronic," but this was found a question too involved for the questionnaire. It is interesting to note that only a minority of one-third or one-fourth of the cases needed professional care. Of the presumed causes given by the non-treated persons, peaches led the field and whiskies was a close second. In the group who had had medical aid the causes were too variegated to classify: peaches, strawberries, whiskies, unknown, indigestion and nervousness were frequently listed.

The breakdown into an asthma-hay fever-ur-

ticaria and a non-asthma-hay fever-urticaria and the finding of a ratio 1:9.7 can be no more than an indication that of all urticaria 9.7 times as many cases occur in non-atopic as in atopic individuals.

CONCLUSIONS

From the literature, the personally quoted experience of fellow allergists, and my own personal experience, a personal history, or a strong family history of allergic disease, is significant indication of the necessity for a careful allergic study of patients with urticaria, whereas a completely negative history makes such a survey almost always futile.

From the fact that urticaria has occurred in this investigation nearly 2½ times as frequently in atopic individuals as in non-atopic, one may conclude that atopy is a factor of considerable importance in urticaria. However, when one calculates the population incidence of non-asthma-hay fever-urticaria and the population incidence of asthma-hay fever-urticaria one finds from the above that urticaria occurs 9.7 times as frequently in the former much larger group. Thus, if a line were drawn between atopic and non-atopic urticaria based upon the co-existence of asthma and hay fever, one might hazard the estimate that atopy is a factor of major concern in only about one of ten cases of urticaria.

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DISCUSSION (*Abstract*)

Dr. Chas. H. Eyermann, St. Louis, Mo.—I am sure all of us are aware of the inaccuracies when statistics are based on the statements of patients, nevertheless, Dr. Swinny's paper presents a different approach to the mystery of urticaria, a disease exemplifying the therapeutic approach to the riddle of etiology, which despite the advent of allergy can still be termed a notional disease. As a result of statistical computation, Dr. Swinny presents three conclusions: (1) that urticaria is more likely to occur in atopic individuals; (2) that only one-tenth of all urticaria occurs in atopic individuals; (3) that cure is not mediated by the allergic constitution. Notwithstanding that as far as practical application is concerned, the third conclusion appears to invalidate the other two, I believe that these data may be an aid in expediting the selection of proper therapeusis.

Having the privilege of a preview I assembled my clinical experiences with urticaria of ten or more days duration, and tabulated the therapeutic measures that brought about success and the failures in relation to atopic influences as predicated by the first two conclusions.

When cure followed the elimination of a food without other means, atopic influences were present in 67 per cent of the patients and absent in the remainder. When cure followed the elimination of food and other measures, atopic influences were present in 75 per cent of the patients and absent in the remainder, for a total of these two groups of 70 per cent with atopic influences. Now when a successful result was obtained by non-allergic measures, the figures are reversed, namely, 36 per cent with atopic influences and 63 per cent without such influences, which corresponds fairly closely with the figures for the failures, namely: 40 per cent of the failures had atopic influences and 59+ per cent did not, and an interesting coincidence is that the figures for those with and without atopic influences are reversed when comparing the totals of the successes and failures.

It is impossible to apply such a posteriori reasoning to the third conclusion or Table 6, but because I infer that it refers to acute urticaria and because it is stated that these lesions were unobserved, it has the greater latency for inexactness and must await the discovery of fundamental principles for explanation. I believe the data that Dr. Swinny has presented emphasize that urticaria in an atopic individual is more likely to be cured by allergic means, while the same complaint in an individual without atopy is more likely to be cured by non-allergic therapeusis.

Dr. Clarence K. Weil, Montgomery, Ala.—I was talking to Dr. Eyermann last night and among the specific things he mentioned catharsis, dilute hydrochloric acids by mouth, bromides, ovarian extracts given orally, and those are the things that he refers to when he says "non-atopic measures."

Dr. Orval R. Withers, Kansas City, Mo.—I want to congratulate Dr. Swinny on his presentation. As far as I know, this is the first survey of the general population in order to determine the atopic factor in urticaria.

Fink and Gay, in 1934, surveyed 170 patients with urticaria and they showed by clinical means that about 20 per cent were due to allergy. If they had not dif-

ferentiated the atopic from the acquired allergies it is possible that their figures might have corresponded somewhat to those of Dr. Swinny, in that approximately one in ten patients who suffer with urticaria are atopic.

We might paraphrase the saying, "all that wheezes is not asthma," by another, "all that wheals is not necessarily allergy." It must be remembered that the fundamental form of skin response is that of a wheal, and it may be due to many factors. The mechanism, as you know, is not known, although probably the most popular theory is that of Lewis, who suggests that possibly some histamine-like substance is liberated from the cells either by trauma from without or by some toxins or poisons from within which set in motion the formation of the wheal.

In my experience with treatment of urticaria, I find that the incidence of relief rather closely parallels the number of patients who have other forms of allergic conditions and that good results occur in about one in ten patients.

Dr. J. Harvey Black, Dallas, Tex.—Did Dr. Swinny make any distinction in listing his groups, between the acute, short-lived urticarias which are very common, and those that persist for weeks and months?

There are many men who feel there should be a good many definite distinctions made between the two, that neither one may be concomitant, and I did not gather whether any distinction had been made.

Another thing which might bring up a question as to the validity of his figures would be the matter of including the short-lived, acute urticarias. Many people may have had one or two attacks and forgotten them because they were of a minor character. Nobody would forget an attack of urticaria that lasted for months.

Dr. Alan Cazort, Little Rock, Ark.—My experience is that about 8 per cent of patients taking large doses of histaminase have thought it helpful. I believe that, had those patients been given an inflation talk and water, a greater portion would have thought themselves helped. I gave them a deflation talk and histaminase, and about 8 per cent think they have been helped. Draw your own conclusions.

Dr. Swinny (closing).—We found in our questionnaire that when we tried to draw a distinction between acute and chronic urticaria, we ran into difficulties that were rather time-consuming, so we thought the index of self-cured, whether or not they had had to consult a doctor, would give some idea as to the chronicity or acuteness of the attacks and when we found the ease of cure to be approximately the same in the two groups, we felt we had some index of the fact that chronicity and acuteness were about the same in the two groups.

In presenting or making any sort of study of statistics, I think we should all accept them with a grain of salt and remember that Disraeli made the statement that there are three kinds of lies: "White lies, damn lies, and statistics," and that is the spirit in which this study has been presented.

INDICATIONS FOR SULFONAMIDE DERIVATIVES IN THE TREATMENT OF ASTHMA*

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INTRODUCTION

In May, 1940, we published in the *Journal of the Medical Association of the State of Alabama*, a report of seven cases of status asthmaticus which were relieved promptly by treatment with sulfanilamide and sulfapyridine. The following two cases are typical of the entire group and give a clear picture of the type of case and the response to treatment.

Illustrative Cases of Status Asthmaticus. Case 1.—A boy of fifteen had had asthma for a period of three years and severe asthma for three weeks. He was hospitalized on January 17, 1940. He was given epinephrine in large doses three to eight times a day. Contact allergens were removed and two elimination diets were tried and finally the diet was restricted to milk alone. These measures failed to give relief. A week after admission to the hospital, he was given aminophyllin, three and three-quarter grains intravenously every six hours, without relief, and the dose was raised to seven and one-half grains. On February 1, he was started on fifteen grains of sulfanilamide every six hours and by evening his wheeze was considerably improved. He required no medication during the night. On the following day his lungs were entirely clear. He was dismissed from the hospital the next evening, thirty-six hours after beginning treatment.

Before sulfanilamide was instituted the temperature was 100.8 degrees, pulse 110 and respiration 38. The white blood cell count was 18,000 with 65 per cent polymorphonuclears, 28 per cent lymphocytes and 7 per cent eosinophils. The sputum showed streptococci, staphyloccocci and pneumoccocci on smear and culture but the streptococcus was the predominant organism. On the second day after starting sulfanilamide, the temperature was 98 degrees, pulse 90, respiration 20 and the white blood cell count was 8,300 with 56 per cent polymorphonuclears, 26 per cent lymphocytes, 7 per cent monocytes, 1 per cent basophils and 10 per cent eosinophils.

Case 2.—A colored man of fifty-nine had had asthma since childhood. His attack of severe asthma had begun eleven days before our first visit. He was given a dose of epinephrine and put at once on sulfonamide treatment in doses of twenty grains every six hours. Two days later, being unimproved, he was sent to the hospital

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where the white blood cell count was found to be 22,500 with 89 per cent polymorphonuclears and 11 per cent lymphocytes. The sedimentation rate was 28 millimeters per hour. The sputum showed a preponderance of pneumococci with a few streptococci and staphylococci. The temperature was 99.2 degrees, pulse 108 and respiration 44. He was given fifteen grains of sulfapyridine every four hours. The following day he was breathing better, but still had many rales at both bases posteriorly. His respiratory rate had dropped to 24. On the third day after starting sulfapyridine, there was no wheeze and the drug was discontinued on the fourth day. On the fifth day after starting sulfapyridine, his white blood cell count was 10,000 with 85 per cent polymorphonuclears and 15 per cent lymphocytes. In subsequent blood cell counts this patient eventually developed 4 per cent basophils and 4 per cent eosinophils. This was the first case in which sulfanilamide failed to relieve. When it was found that the sputum contained a preponderance of pneumococci it seemed logical to switch to sulfapyridine which promptly cleared up the patient's infection and relieved his status asthmaticus.

Routine Dosage.—Our routine treatment of patients with status asthmaticus has consisted of rest in bed, removal of all possible contacts and epinephrine or aminophyllin given as often as necessary to control wheezing. Sulfanilamide is given according to the following schedule:

> Eighty grains per day for two or three days until the temperature, pulse and respiration have returned to normal, the leukocytosis has disappeared and the symptoms have been relieved, then 60 grains per day until the sputum has lost its purulent character both as to gross appearance and microscopic examination.

At one time we considered the advisability of continuing the sulfanilamide until the sedimentation rate had returned to normal, but we have made the observation that patients with a normal sedimentation rate before sulfanilamide generally have a rapid rate after its use. We believe that the rate will continue rapid as long as sulfanilamide is given. We have, therefore, discarded this procedure as an indication for cessation of treatment but insist upon its value in indicating the need for treatment with sulfanilamide or sulfapyridine.

Sulfapyridine is used as in pneumonia, 2 grams as an initial dose, then 1 gram every four hours until 25 grams have been given.

Sulfathiazole has been given in doses of 1 gram every four hours until 25 grams have been given.

Clinical and Laboratory Findings Before Treatment.—With one exception, the temperature of these patients before the use of sulfanilamide and sulfapyridine was elevated, varying between 99.2 degrees and 103.4 degrees. The pulse rate in all cases was elevated, varying between 96 and 130. The respiratory rate was elevated in all cases, the minimum rate being 25 and the maximum 48. The white blood cell count was elevated in all cases, the lowest count being 11,400 cells and the highest 22,500 cells. The polymorphonuclears were under 75 per cent in two cases and between 78 and 89 per cent in five cases. With one exception in which the eosinophils comprised 7 per cent of the total white cell count, the eosinophils were uniformly low, there being no eosinophils at all in four cases. The sedimentation rate in all cases was increased with an average of 25 millimeters per hour. The sputum was thick and varied in color from a pale yellow to a deep yellow or green. On smears or culture, it showed chiefly streptococci, pneumococci and staphylococci with, occasionally, other organisms. It seemed rather striking to us that all of these cases showed some evidence of infection, in the form of fever, leukocytosis, purulent sputum and an increased sedimentation rate. These findings contrast directly with those that are typical of the allergic state, in which the white blood cell count, as a rule, is not elevated, the eosinophils rather than the polymorphonuclears are increased, the sedimentation rate is slow and the sputum is clear, thin, pale and frothy.

Clinical and Laboratory Findings After Treatment.—Two to four days after the beginning of treatment with sulfanilamide all temperatures were normal. Except in one case the pulse rate was between 70 and 90 and the respirations between 18 and 24. In the exceptional case, the temperature was normal, the pulse was 144 and the respiration 28. The white blood cell count was between 7,000 and 9,000 except in two cases in which it was between 15,000 and 16,000. The polymorphonuclears averaged 69 per cent. The eosinophils varied between 0 and 12 per cent, the average being 6 per cent. The sedimentation rate varied between 24 and 29 millimeters per hour. The sputum in all cases had become colorless and thin.

Symptomatic Response to Treatment of Status Asthmaticus.—In every one of the seven cases definite improvement was observed within 24 hours after instituting treatment with sulfanilamide or sulfapyridine. The patients could lie down flat in bed, breathe deeply and even eat without attacks of dyspnea. Five of the seven patients were in the hospital and all were well enough to be dismissed the second or third day after beginning treatment with these drugs.

The patients' own words often described their relief better than any technical description. One said on the third day after starting sulfanilamide that he "breathed so deeply that it hurt." Another within twenty-four hours was breathing so quietly that the mother, who had been accustomed to his constant wheezing over a period of nineteen years, became alarmed at the quietness of his breathing and was afraid that he was dead. A third individual stated that for the first time in three months he was able "to lie flat in bed and enjoy the luxury of taking a deep breath." With the others it was the same. Some of our colleagues who cautioned us against overenthusiasm were brought in to see these patients and were impressed with the relief following treatment.

Sulfanilamide Derivatives in Other Types of Asthma.—Having observed the effect of sulfanilamide and sulfapyridine on patients in status asthmaticus due to acute respiratory infection, we began to wonder what effect the drugs would have on other types of asthma. We therefore looked over a group of cases of asthma and classified the attacks into three main types:

(1) Attacks due solely to allergic causes.

(2) Attacks due primarily to infection.

(3) Attacks in which both allergy and infection played a part.

At one extreme were cases of pollen hay fever accompanied by severe asthma; at the other extreme were cases of status asthmaticus such as we have described above, in which for the time being infection seemed to be the predominant factor. In between these two groups were all gradations, the importance of allergy and infection varying in inverse proportion.

In cases of status asthmaticus due to an overwhelming contact with a specific antigen, and in which infection played no part, we have been pleased with the results of bed rest, avoidance of antigens and the use of epinephrine or aminophyllin. In this type of case, the blood and sputum contained a high percentage of eosinophils, the sedimentation rate was slow, the sputum was clear, thin, frothy or gelatinous and the temperature was normal.

We have used sulfanilamide, sulfapyridine and sulfathiazole in a few cases in which there was evidence both of the allergic state and of infection. The following cases are presented to illustrate the type of case included in this category and the response to treatment with these drugs.

ILLUSTRATIVE CASES OF CHRONIC ASTHMA

Case 3.—A nurse, aged 38 years, consulted us for relief of persistent chronic asthma. Skin tests showed reactions to several inhalants. When first seen by us she had a white blood cell count of 9,700 with 56 per cent polymorphonuclears, 41 per cent lymphocytes and eosinophils 1 per cent. The sedimentation rate was 18.5 millimeters per hour. The sputum contained 80 per cent polymorphonuclears, 18 per cent lymphocytes and 2 per cent eosinophils; the smear of the sputum showed streptococci and pneumococci. The patient was given sulfathiazole grams 2 at once, followed by 1 gram every four hours for seven days. A week later, at her own estimation, she was 90 per cent improved. The white blood cell count was 7,100 with 58 per cent polymorphonuclears, 33 per cent lymphocytes and 5 per cent eosinophils. The sedimentation rate was 16 millimeters per hour. The sputum showed 50 per cent polymorphonuclears, 40 per cent lymphocytes and 10 per cent eosinophils, and the direct smear still showed some streptococci and pneumococci. The patient has since been treated by desensitization, mixed vaccine and avoidance of contacts. Though she remains free of symptoms during the day, she has to take some medication for relief at night.

Case 4.—A man with chronic and persistent asthma gave no reactions on complete skin testing with foods, pollens, inhalants and moulds. His hemoglobin was 121 per cent with red blood cells 5,800,000. The white blood cell count was 10,800 with 54 per cent polymorphonuclears, 41 per cent lymphocytes and 1 per cent eosinophils. The sedimentation rate was 9 millimeters per hour. The sputum was yellowish and contained 60 per cent polymorphonuclears, 30 per cent lymphocytes and 10 per cent eosinophils. He was given 80 grains of sulfanilamide the first day. On the second day his blood sulfanilamide was only 5 milligrams. The daily dose was then raised to 120 grains for two days. On this dosage the blood sulfanilamide reached a level of 15 milligrams. Treatment was continued for three days more. After treatment the hemoglobin was 108 per cent, the white blood cell count 8,400 with 65 per cent polymorphonuclears, 26 per cent lymphocytes, and 9 per cent eosinophils. The sedimentation rate was 16.5 millimeters per hour. The sputum was colorless and thin. The patient estimated his improvement at 80 per cent. He was subsequently treated with vaccine and large doses of potassium iodide.

The study of several cases of this type indicated that the white blood cell count is likely to be normal with a low eosinophil count, while the polymorphonuclears may be normal or somewhat increased. The sedimentation rate is variable, but is never so high as in those cases with marked evidence of infection. The chief criterion of infection was a sputum which was yellowish or greenish in appearance and which showed on microscopic examination a preponderance of polymorphonuclears and a small number of eosinophils. Though the number of cases studied is too few for any statistical analysis, either of laboratory features or therapeutic re-

sponse, it is our impression that these individuals show a clinical improvement that is proportionate to the evidence of infection.

We have used the drug in some cases which on critical analysis showed no evidence of infection. In these cases we have felt that improvement was not striking. In two cases of the latter type we were struck by the change in the sedimentation rate as a result of treatment. In one case it increased from 7.5 millimeters to 15 millimeters per hour and in the other case from 5.5 millimeters to 17.5 millimeters per hour.

DISCUSSION

Our experience with the sulfonamide derivatives has impressed us with the importance of infection in causing status asthmaticus, in prolonging the symptoms of chronic asthma and in defeating our therapeutic attempts based purely on an allergic etiology. Richard Kern,[2] in an article on asthma which appeared in the "Medical Clinics of North America," November, 1939, expressed perfectly the attitude which we have come to hold: "After all, it is infection which plays havoc with our cases of asthma." The sulfonamide drugs have a definitely beneficial effect in clearing up respiratory infection and the extent to which they afford relief is in direct proportion to the amount of infection present. We are beginning to feel that bacterial vaccines, which have recently come into disrepute, may prove to be of value when they are used to immunize an individual against infection after the acute infection has been relieved.

In the selection of the drug to be used in any given case, one should be guided by the type of organism found in the direct smears of the sputum. If the preponderant organism is streptococcus, sulfanilamide should be used. If it is pneumococcus, sulfapyridine or sulfathiazole may be used. If it is staphylococcus, sulfathiazole should be used. Culture of the sputum may be done to prove the type of organism, but the organism which is most abundant is more readily determined in the direct smear.

We wish to emphasize the fact that familiarity with the sulfonamide derivatives will not prove a substitute for training in allergy and the use of these drugs cannot be expected to take the place of other methods of treatment, but rather to pave the way for their more successful use. Specific desensitization, avoidance of contact with offending antigens and meticulous care in preventing respiratory infections are essential for good results both in clearing up attacks and preventing future attacks.

CONCLUSION

(1) The sulfonamide derivatives are extremely valuable drugs in the treatment of status asthmaticus brought on by acute respiratory infection. The criteria for the choice of drugs and a schedule of dosage has been given.

(2) In chronic asthma in which evidence of infection can be found the sulfonamide derivatives afford definite improvement and pave the way for more effective treatment along allergic lines.

(3) The use of the sulfonamide derivatives will not supplant allergic methods of treatment, but should prove a valuable adjunct.

(4) Every step that is taken to prevent a recurrence of respiratory infection is an important step in the prevention of future attacks of asthma.

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DISCUSSION (*Abstract*)

Dr. Warren T. Vaughan, Richmond, Va.—The *Journal of the A.M.A.* for October 12 had a query concerning the use of sulfanilamide compounds in resistant asthma. The answer did not mention Dr. Climo and Dr. Weil's earlier paper. It could very well have done so and would have been more complete.

Dr. Climo has brought home to us the fact that these compounds are of value in status asthmaticus when status asthmaticus is associated with coccus infection. They can be used in severe asthma associated with coccus infection even though it be not status asthmaticus.

He has brought to us the point that the examination of the sputum is the most important thing, more important than the white count or the sedimentation rate. It raises the question whether all status asthmaticus is associated with infection or whether we should study all such cases carefully and find whether there is evidence of infection. It may be that there are two types of status asthmaticus, with and without infection. We should bear these two possibilities in mind and thus we may help Dr. Climo to determine whether they are all due to infection.

Now, I personally hate to give anything which is a potential sensitizer to a person who is allergic, particularly if it is highly potential, and this, of course, applies to the sulfonamide compounds which produce sensitization in roughly 15 per cent of cases. In my own work I apply this reservation to all of the other new remedies that are suggested from time to time, particularly when they are to be given parenterally.

In the early days I never used milk injections for nonspecific desensitization. I rarely use peptone. I

do not use epinephrine in oil or in gelatine unless other methods have failed, because we know that a certain proportion of people can be made allergic to these things, and for that reason we prefer to use the simpler methods. Possibly we do not get quite such good results, but it puts us on our toes to get results, and I think probably our results in relief will compare with those of the average allergist. However, when you have a case of status asthmaticus, it is just as serious as a case of pneumonia, and there this consideration can be ignored.

I am not sure that the major allergic has any higher tendency to become sensitized to a new, strange, environmental allergen than the minor allergic or the non-allergic, and these synthetic chemicals are certainly examples of that. We know that the major allergic is more inclined to become sensitized to those things to which he is commonly exposed, but we are not sure about the others. This is a study which should be made.

So I feel that Dr. Climo has brought us a very helpful method to be used with caution, but without hesitancy in this particular type of condition, where usually all other methods have failed.

Dr. Marion T. Davidson, Birmingham, Ala.—I have never used any of the sulfonamide drugs. A short while after Dr. Weil's paper appeared in the *Journal of the Medical Association of the State of Alabama* I had the opportunity to discuss it with him. When I received his invitation to discuss this paper I took it in the nature of a challenge to say publicly some of the things I said to him then and that is my reason for this discussion.

I feel that we are indebted to Dr. Weil and Dr. Climo for giving us this very timely and excellent paper, particularly at this time when every time the postman comes into our offices he brings a sackful of advertisements on gland products and vitamins and last, and by no means least, on sulfonamide drugs. If the sulfonamide drugs will cure asthma it will not be long before a good many present in this room will be forced to seek a new specialty, because already a fair percentage of my patients have had one or more of these drugs administered before they have come to me.

I have never been able to accept the idea of bacterial allergy. It seems to me that not only is the local skin test reaction to bacterial products and that to allergenic materials entirely different, but also the deep tissue reactions and the constitutional reactions to the two types of materials are different. However, allergenically sensitive tissues may succumb to bacterial infection, but there is a widely accepted belief that allergic individuals are exceptionally resistant to such infection.

It seems to me that the most definite point of similarity between reactions to allergens and to bacterial products is in the Arthus type of phenomenon of local tissue sensitivity following repeated injections of allergenic materials, and it seems to me that if you are looking for points of similarity, there is almost as much similarity between the tissue reactions to bacterial products and those to malignant growths. No one thinks that bacterial infection plays any part in malignancy.

To the present time I have treated the type of patient that I feel that Dr. Weil and Dr. Climo are talking of, with rest in bed, preferably in a hospital room, as free of allergenic material as possible and on a diet non-allergenic to the individual as judged by skin tests. Next in order is the oxygen tent with helium and oxygen preferable to oxygen alone. When expense is important I have found that the 50-50 mixture of helium and oxygen works almost as well as the 80-20 usually advised and cuts the expense by reducing the amount of helium used.

Of course epinephrine and ephedrine and sedatives are used where indicated and one other procedure has been life-saving for me in some cases and that is the intravenous infusion of 5 per cent glucose in normal salt solution. To a badly debilitated patient this gives 25 grams of glucose to replenish the liver stores and 4.5 grams of sodium chloride to replenish the depleted store of this salt.

After the passage of the acute emergency I believe we have all used vaccines. I have used stock, cold vaccines followed by various autogenous vaccines, and I have the feeling that I have had as good results from vaccines made of organisms which gave no local skin reactions as from organisms which gave definite skin reactions.

In those cases of asthma where bacterial infection complicates the picture and in which heretofore we have been dependent upon vaccines, the sulfonamide drugs are a distinct addition to our therapeutic armamentarium. In properly selected and controlled cases they offer the hope of reducing the period of recuperation from a matter of weeks to one of days, and I feel that we are indebted to Dr. Climo and Dr. Weil for bringing this to our attention.

Dr. Oscar Swineford, University, Va.—I have been using the sulfanilamide derivatives for a year or two in cases similar to those described, and I do not get such good results as the authors here have recorded. I have, however, seen two or three acute cases that responded rather dramatically.

I had a man who had had long-standing bronchiectasis due to a pneumococcus, who had been incapacitated by asthma for about two years. We started him on some sulfapyridine, which he could not take, because he vomited every dose he took.

We kept at it for a day or two and then switched to sulfathiazole, which he could take. A positive pneumococcus culture (Type VIII) which we had obtained repeatedly over a period of two years became negative, and he became very much improved. He was a physician. He was able to go back to his practice.

He began to get worse again about three or four weeks ago and on culture we found this same Type VIII pneumococcus in his sputum. We started him on the sulfathiazole again, with subsequent improvement.

I had a similar case due to a mixture of staphylococcus and streptococcus, in which we tried sulfathiazole and kept it up for three weeks. The cultures, the character of the sputum and the intensity of the asthma were unaffected.

Dr. Homer E. Prince, Houston, Tex.—I agree with the essayists that infections often are flies in the ointment in the management of many asthma cases. Any rational procedure capable of overcoming them would be a distinct help. Treatment must not stop here, however, but after the load of infection is removed from the patient he must be carried along with orthodox management until his allergy is controlled. I believe

that a great many patients will experience fewer and fewer episodes of infection if their allergies are controlled.

On the other hand, my experience has been similar to that of Dr. Swineford in that in a few cases chemotherapy has been practically useless.

Dr. Stanley F. Hampton, St. Louis, Mo.—When I was associated with Dr. Robert Cooke, at the Roosevelt Hospital in New York, we treated several patients with the sulfonamide group of drugs. There were about ten cases in the group and I assume Dr. Cooke is continuing the study.

The cases fell into the group of infective asthma. Those cases showing the predominating organism, on repeated cultures of sputum or foci such as antra or tonsils, to be a streptococcus, were treated with sulfanilamide, and those whose cultures revealed the predominating organism to be a pneumococcus were treated with sulfapyridine and later sulfathiazole. I cannot say our results were as outstanding as those reported today, but certainly in general they were encouraging.

The best results were obtained in those cases where the same predominating organism found in the sputum culture was found in the suspicious focus of infection. For instance, I recall a case that showed on several cultures a predominant Type XXIX pneumococcus in both the sputum and in the antral washings. This patient, under sulfapyridine therapy, had rather definite relief of symptoms. In only a few of these cases, however, did the organism disappear from the cultures.

There was an instance that occurred that would suggest that the action of these drugs is not specific in its relief of asthma. A patient with daily asthma of long standing whose culture showed streptococci was treated with sulfapyridine. The patient received complete relief under sulfapyridine therapy, only to have asthma recur upon cessation of the drug. After further studies of sputum cultures, which again revealed streptococci, sulfapyridine therapy was again instituted, with dramatic relief of the asthma, even though the pneumococcus was not present at all in the various cultures.

In regard to Dr. Vaughan's words of caution a moment ago, I should like to cite an example of a probable induced hypersensitivity to sulfapyridine. A young woman with status asthmaticus was treated with sulfapyridine for a period of about ten days. Considerable relief was obtained. The drug was discontinued and the patient discharged from the hospital. About two weeks later she returned in a state of status asthmaticus, and the same type of therapy was administered. After the first dose of sulfapyridine the patient developed a very marked angioneurotic edema. Incidentally, scratch and patch tests with sulfapyridine were negative. I feel that it is very likely that the patient was sensitized to the drug on the first period of the treatment and that the angioneurotic edema developed as a result of the second administration of the drug.

Keeping in mind the above mentioned factors, I do feel that the results obtained with treatment of intrinsic asthma in the presence of infection with the sulfonamide group of drugs warrants further study.

Dr. Weil (closing).—It is not difficult to understand why some of you report success with these drugs while others report failure. It is entirely a question of the type of case you try it on. I am certain that it was a stroke of luck that our first seven cases happened to respond well. It was in the winter time when respiratory infections were at their peak. We could not repeat the results in the summer time. We do not want you to get the impression that we think the sulfonamide drugs will cure every case of status asthmaticus or even every case that is due to bacterial infection. In certain cases, however, the results are most dramatic and relief is obtained quickly when other methods have failed. Having watched the drug work successfully in some cases, we have been trying it out on others in order to determine the indications for using these drugs.

We may have given a false impression in regard to the results obtained in patients who have symptoms of allergy and infection at the same time. We think we get some improvement, which seems proportionate to the amount of infection. The relief is only temporary. We make no claim of permanent cure, but, after all, aminophyllin does not cure, either.

One of my colleagues treated a case of pyelitis with sulfanilamide. The patient also had asthma. Both her pyelitis and asthma cleared up. We cannot be assured that either will stay well. The pathologic state of the lungs and urinary tract may make reinfection more likely than in a normal person. The patient is no less grateful for the relief she has obtained.

What happens to these patients after they have been relieved of their status asthmaticus by sulfonamide derivatives is a problem in itself. The winter season will give us ample opportunities to find out.

ECZEMA IN INFANCY AND CHILDHOOD*

By KATHERINE BAIN, M.D.
St. Louis, Missouri

The pediatrician Blackfan[1] reported in 1916 one of the first groups of patients with eczema tested for protein sensitization. Since then, there have appeared in the literature many "series of cases" representing the personal views of various authors upon the classification of causes, the value of cutaneous testing, the dietary management, and the local care. The only attempt at laboratory experimentation in the cause of eczema was that of Hansen[2 3 4 5] on the fatty acid content of the blood. This theory, though an intriguing one, has not been substantiated.[6 7 8] What we know today is little more than we knew almost 25 years ago when Blackfan reported his 27 cases. What progress has been made in eczema is from the clinical side rather than from the laboratory side, and is a by-product of the phenomenal growth of interest in al-

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lergy as a whole. Pediatricians with a flair for allergy have been led to collect and observe large groups of eczema patients, to apply some general principles of allergy and to gather, if not much in the way of fact, at least some keen clinical impressions regarding management. And the incompleteness of our knowledge and the imperfections of our treatment of infantile eczema are recognized by those with the widest experience.

In presenting a group of cases of eczema certain explanations are necessary. No group of such cases can be followed long enough to produce accurate statistics. One may collect data on age, sex, family history, and diet, subject to the limitations of the patient's memory and accuracy. An evaluation of therapy depends upon the controlled observation of many cases over a long period of time and unfortunately it is seldom possible to follow a group of cases long enough to secure accurate statistics. Parents of children with eczema are renowned as wanderers, going from doctor to doctor in hope, and leaving in despair. One's failures "go the rounds"; one's successes are likely to attain an exaggerated importance. The data here presented represent the impressions obtained through years of practice, specifically applied to 168 cases of eczema seen in the St. Louis Children's Hospital, in the Children's Allergy Clinic of the Washington University Dispensary, and in private practice during the years 1935-1940.

The term "eczema" is used in this paper loosely. The dermatologist's interpretation of it is based on morphology, the allergist's on immunology. The pediatrician uses "eczema" in a broad sense and makes no clear-cut distinction. Some of the patients in this group do not represent eczema from a dermatologic standpoint. The patients, however, were cured by dietary restrictions. For the simplest and most satisfactory description and classification of eczema the reader is referred to Hill's numerous articles.[9] [10] From a practical standpoint, classification is of little importance. Finkelstein's[11] arbitrary identification of seborrheic eczema by means of a crack under the ear fails of verification. Seborrheic dermatitis and atopic eczema merge into each other, frequently appear together, and are often relieved by the same measures. Many cases which start as seborrhea bloom into real infantile eczema. I believe with Sulzberger[12] that one cannot always distinguish atopic from non-atopic eczema by the character of the lesions, but only by lengthy observation and study. This group consists of the cases sent to the Pediatric Allergy Clinic by pediatricians and therefore is not strictly atopic dermatitis, but represents the pediatric concept of eczema.

The group of 168 patients (*Table 1*) consisted of 123 infants (under 2 years) and 45 children (between 2 and 14 years). The ratio of males to females was 4:3, somewhat less than in our asthma clinic, where the ratio is 2 to 1. The preponderance of males in a children's allergy clinic is striking. The percentage of colored patients in the group was 15.7 per cent, approximately the same as the negro population of St. Louis. Statistics on family history are in agreement with those of other writers,[13] [14] approximately two-thirds of the patients having a history of some major allergic manifestations in the family.

STATISTICAL MATERIAL RELATING TO THE COMPOSITION OF THE GROUP OF 168 PATIENTS WITH ECZEMA

Age		Sex		Color	
Infants Under 2 Years	Children 2 to 14 Years	Male	Female	White	Negro
123	45	96	72	142	26

Table 1

From the standpoint of management, age of onset (*Table 2*) and type of feeding at onset (*Table 3*) are the most important elements in the history. Of all the cases, infants and children, where reasonably accurate history could be obtained, 25 per cent began before one month, 64 per cent before 3 months, and 90 per cent before 1 year. Other writers, Netherton,[15] Goodman and Burr,[16] Rappaport and Hecht,[17] have drawn attention to the early age of onset. In reviewing the type of diet that the infant was

AGE AT ONSET

	Per Cent
Under 1 month	25
Under 3 months	64
Under 1 year	90

Table 2

TYPE OF DIET AT ONSET	Per Cent
Breast only	22.4
Evaporated milk only	15
Milk, orange juice, and cod liver oil	69.2

Table 3

receiving when eczema developed, it was surprising to find that 22.4 per cent, almost one-fourth, were on breast only. Another 15 per cent were receiving evaporated milk only, which does not verify Ratner's[18] contention of the non-allergenic qualities of evaporated milk. A diet of milk, human, evaporated, or some other form, plus orange juice and cod liver oil, was being taken by 69.2 per cent of the patients. One would expect this, since 64 per cent of the cases began under 3 months of age when the infant's diet is limited.

With this information obtained from history, a practical plan of approach can be devised. All cases of eczema, by the time they reach the pediatrician, have been taken off orange juice and cod liver oil. I have never seen a case of severe infantile eczema cured by the removal of these substances. Hill's[19] experience has been the same. I see, very commonly, rickets and even scurvy develop in cases of eczema when these supplementary foods have been removed and no substitution made. An occasional child scratches more with orange juice and an occasional child spits up cod liver oil. Probably only in very rare instances do cod liver oil and orange juice need to be eliminated. However, because of the psychologic effect on the mother, who is convinced of their harmful action, often it is wiser to remove them and give cevitamic acid and some concentrated form of vitamin D.

This leaves milk to be dealt with as the causative agent. One may accomplish this in three ways: (1) by using heated milk, (2) by adopting a different species, (3) by eliminating milk entirely. Kerley,[20] as far back as 1926, advocated six-hour boiling for milk. Ratner[21] believes that evaporated milk is so changed by heating that it is non-allergenic. His conclusions were reached by means of experiments with anaphylaxis in guinea pigs. Unfortunately, the human infant's eczema is not comparable to the reaction obtained by "shocking" animals. Clinical experience shows that though mild cases of milk sensitivity respond to heated milk, severe cases do not tolerate even small amounts of evaporated milk. My clinical experience has been that dried milk is somewhat superior to evaporated milk, an observation which is at variance with Ratner's guinea pig experiments. All babies in our newborn service who need complementary feeding get evaporated milk, yet we see eczema in St. Louis as frequently as it is seen elsewhere. Evaporated milk is no panacea. If the eczema is mild and milk is suspected, our policy is to use a heated milk, evaporated or dried. If no relief is obtained we next try change of species, using goat's milk. A good evaporated goat's milk is available at a reasonable price. A few cases, particularly mild ones, will respond to one of these feedings, heated milk or goat's milk. But the severe case requires complete elimination of milk. Hill[22] accomplishes this by means of Sobee. There are other products, Cemac, Mulsoy, and more recently Kreme O'Soy, reported by Levin.[23] We have used a simple, cheap, non-proprietary formula, made of soy bean flour, a report of which is being prepared for publication. By whatever means the elimination of milk is accomplished, its removal is the nearest to specific treatment which we have for eczema. Fifty-eight patients were taken off milk. Fifty-one improved. In 7 others there was no improvement in spite of rigid adherence to diet. Elimination of milk was instituted only for those patients having a severe eczema and continued only if the weight gain was satisfactory. Several patients improved markedly when taken off of milk, but consumed too little of a substitute to maintain good nutrition. It was felt wiser to accept an eczematous skin rather than incur a severe degree of malnutrition.

Infants over 4 months of age received cereal in the form of rice or oats, vegetable limited to carrots, and later apple sauce. A gradual enlargement of the diet took place after 8 months, one new food being added at a time.

The dietary outline for a case of eczema of 5 or 6 months of age with a history dating back to one month is as follows:

Milk

(1) Heated ("Dryco")

(2) Changed species (goat's)

(3) Eliminated (soy flour mixture)

Choice of 1, 2 or 3 depends to some extent on history of diet at onset, but largely on severity of symptoms.

Vitamin C, cevitamic acid 25 mg. or pineapple juice.

Vitamin D, Drisdol 2 drops or halibut liver oil with viosterol, 10 drops.

Rice

Carrots

Of course, such a scheme is arbitrary, the result of trial and error, aided by deduction. It does not fit all cases, but is applicable to the majority of young infants. Adequate and complete history taking will guide the physician in outlining diet in the individual case, more especially in those starting after 6 months. An eczema starting at 4½ months, 2 weeks after the introduction of cereal, or at 1 year after the addition of egg, need not be deprived of milk until more logical restrictions have been in force. When one remembers that almost 70 per cent of the cases started before any solids were added to the diet, such a simplified scheme is practical.

Whether or not skin tests are of value in detecting the offending substance in eczema is still a matter of controversy. Ten years ago, when Dr. Scott Smyth and I[14] reported our first group of patients with eczema, we thought tests were important. Today I see no necessity for skin testing the majority of cases. Positive tests under 6 months are rare. If one gets positives at any age, what will those positives be? Egg, wheat, milk. If these substances give positive tests they will be eliminated, and if the tests are negative these foods will be eliminated anyway. Correlation between skin tests and clinical sensitivity is far from 100 per cent. Egg is the most common reactor, but accounts for only a small number of cases. Wheat, which exceeds milk in order of skin sensitivity, is clinically less often the offender than milk. Not all cases in this group were tested. From a study of the 30 cases which were tested for milk and from whose diets milk was removed, it is seen (*Table 4*) that the proportion of positive reactors to milk is 23.3 per cent, approximately that found by Hill (18.5 per cent) and by O'Keefe and Rackeman (28 per cent). In the group which reacted to milk, some failed to show clinical improvement following its removal. In the group which did not give a skin reaction to milk, many cases improved after a clinical trial of a milk-free diet. Stating this another way, if the skin test had set the pattern for therapy, 16 2/3 per cent would have improved, as against 80 per cent who did improve following arbitrary milk withdrawal. Rappaport and Hecht,[17] Netherton,[15] Dowling,[24] Osborne and Walker,[25] agree that management can be successful in most cases without the use of cutaneous tests. From the standpoint of practical management, tests may be discarded and a careful history substituted. In a small number of cases, particularly older infants and children where the diet is more varied and trial and error more complicated, skin tests are occasionally of value. The strong possibility of marked clinical sensitivity in the presence of negative skin tests must be remembered. One of the most striking cases in this group was a boy of 9 years with extensive eczema dating from the age of 9 months at the time of weaning, who had all negative tests, but cleared and stayed clear on a diet eliminating egg, milk and wheat. Too frequently the physician is influenced, by popular opinion or family insistence, to perform useless tests. The time is better spent in observation and in filling in gaps in the clinical history. Patience and care outweigh any amount of back-scratching.

RELATION BETWEEN SKIN TEST* TO MILK AND CLINICAL COURSE FOLLOWING REMOVAL OF MILK FROM DIET

30 Cases

			Improved		Not Improved	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Skin test negative	23	76.6	19	79	4	21
Skin test positive	7	23.3	5	60	2	40

*All tests were done by the cutaneous method.

Table 4

Local treatment has as important a place in the care of infantile eczema as dietary regulation. In the care of the skin, knowledge of what not to do is more important than what medication to use. Avoidance of irritation is paramount. Time expended in instructing a mother or nurse in what to avoid will be well spent. Instructions include (1) no soap or water, clean with mineral oil. Some proprietary oils contain peanut oil and antiseptics which are irritating. (2) No silk or wool or feathers. Use soft, well-washed cotton garments. In order to minimize contact with adult clothing, carry the child in a sheet. Various writers[26] [27] have emphasized the role of feathers and dust in eczema. Whether these substances act as specific inhalants or contactants, or as nonspecific irritants I do not know. Whatever the mechanism, they are known to make eczema worse. (3) Prevent scratching. Restraint of an infant with eczema requires ingenuity and long practice. In the hospital with experienced nurses complete immobilization is possible.

Rarely can this be accomplished in the home. One is justified in using strong sedation for a period until the itching has disappeared. Mechanical restraint produces a physical handicap if continued too long and carries with it danger of personality derangement due to excessive thwarting. One accepts the need for restraint as a necessary evil and as less damaging psychologically than severe itching and scratching.

The eczema cures must number hundreds. By the time the physician sees the case, the druggist, neighbors and relatives have supplied many salves, lotions, baths, and what not. Sulphur is the common ingredient, and most cases of eczema show the results of its over-zealous use. We use two types of treatment: (1) a mild ointment, such as 4 per cent boric, for an acute eczema, and (2) tar in some form for chronic thickened eczema. I have no idea why tar works, but it is the only local treatment that I know which has any effect on eczema.

Dietary regulation and local care of the skin constitute only part of the management of a case of eczema and must be supplemented by hours of work in parent education and general child management. Hellier,[28] in an article entitled "The Modern Treatment of Eczema," says:

> "The practitioner is often faced with the treatment of a whole family, which consists of an hysterical mother, a father worn out by loss of sleep, and an intelligent looking baby who is quite well and healthy except for the skin eruption." He goes on to add, "stay in the hospital gives the parents time to recuperate." As Sulzberger[12] says, "The mother and other persons who are taking care of the child must commonly be regarded as the major sufferers."

Hospitalization for a severe case of eczema is almost a necessity. The care which experienced nurses can give far exceeds anything which can be done at home. Freedom from irritation, adequate restraint, accuracy of diet, and frequency of observation combine to hasten recovery. When a mother sees her child clear up in the hospital she resolves to follow instructions and becomes teachable. Once having convinced a parent that it can be done, the specific steps are more easily taught. Rigid adherence to diet seems worth while. Precision of hospital routine can be learned and carried on in the home.

It is frequently stated[29] that the hospital is no place for a child with eczema because of the danger of respiratory infection. One hesitates to expose an eczematous child to such danger, but a severe eczema of long standing requires heroic measures and one must take such a risk. Sixty-four cases in this series entered the hospital one or more times, most of them during the winter months, without developing a serious respiratory infection. On the other hand, many of the babies had such severe secondary skin infection that hospitalization was necessary. Sulzberger[12] states there is "practically no danger of infection or blood poisoning." Forty-nine of our cases had severe secondary infection, in some instances with temperature of 104°, and one a positive blood culture, pneumococcus Type II. All recovered.

To prognosticate is one of the most interesting pastimes in the care of infants with eczema. As I said in the beginning, no one person can follow a large enough series in its entirety for a long enough period to quote statistics on outcome. One can gain only impressions from observation. Many cases of eczema get well without treatment. A few retain their eczema into adolescence, in spite of all measures at our command. The majority can be improved and some entirely relieved if the parents are intelligent and willing to follow instructions. Unfortunately, eczema is only the beginning of trouble for some of these children. Fifty, or almost one-third, developed some other type of allergy, asthma being the most common. With a few exceptions, these cases of asthma followed severe eczema. In other words, an infant with severe eczema, and a strong family history of allergy, has a good chance of developing asthma. One of the interesting things about staying a number of years in one clinic is to see patients whom one treated for eczema return with asthma, or later still with vasomotor rhinitis. The allergy of childhood is not static.

In conclusion one word of caution in regard to therapy. Any dietary restriction in infancy must be completely compensated. Withdrawal of milk must be accompanied by substitution of a product which the child will take and which will maintain adequate nutrition. One infant in this series had a severe nutritional edema, with blood protein of 3.0 gm. per 100 c. c., due to withdrawal of milk without proper replacement. Addition of vitamins A, C and D is necessary no matter what the type of diet. In general, cases of mild eczema are treated by local means and the mother urged to ignore the lesion. Removal of essential foods from a child's diet because of mild flexural eczema is unwarranted. Minimizing minor allergies and treating the child like a normal human being will go far toward preventing the anxieties and neuroses the pediatricians are seeing among their older children.

Our knowledge of what to do is so limited that until more fundamental facts are discovered, we shall be wise to restrict the diet only in those cases where the symptoms are of such severity as to cause great distress.

SUMMARY

One hundred and sixty-eight cases of eczema in infancy and childhood, seen in a five-year period, are reported.

The age of onset and the type of feeding at onset are correlated with management.

Twenty-two and four-tenths per cent (22.4 per cent) of the patients were on breast feeding alone when eczema developed.

Milk is the most common single offender, and its elimination offers the greatest chance for cure.

A dietary outline is laid down, and the need for complete compensation for dietary restriction is stressed.

Value of skin testing, type of local care, complications, and outcome are discussed.

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DISCUSSION (*Abstract*)

Dr. W. Ambrose McGee, Richmond, Va.—The most prevalent skin disorder seen in pediatric practice is eczema. The results that have been obtained in the care of that condition are far from favorable. Much of that is due to the fact that more emphasis is laid on treatment of the skin condition rather than the infant with the eczema. It has been my experience that if a thorough investigation is conducted, the results are very satisfactory. Usually when the infant having eczema is cared for from birth, it is possible to overcome the condition by substitution of a vegetable milk for animal milk, one vitamin C preparation for another, or one fish oil for another, and so forth. Likewise, avoidance of mixed fish oils, mixed cereals, or vegetable soups is helpful. Recently it has become possible to obtain precooked single grain cereals, namely: barley, oats, wheat and corn. Mothers popularized mixed precooked cereals, as they are easily prepared.

In a recent review of five hundred pediatric cases I have found that cow's milk casein sensitivity is the most frequent etiologic agent in eczema. Lactalbumin is usually not a big factor, as boiling of cow's milk generally destroys sensitivity to it. Three years ago, before the Pediatric Section of the Southern Medical Association, I reported a series of cases showing casein sensitivity. For those cases vegetable milks are generally excellent. Since pediatricians no longer use unboiled milks for infants, lactalbumin sensitivity except with breast milk, is of no real etiologic significance. If casein is the offending agent it is useless to attempt to substitute any form of animal milks, as all animal milks have casein, and evaporating, powdering or boiling does not overcome casein sensitivity.

I recall a child on breast milk who had eczema when the mother ate strawberries or cucumbers. It would clear up on withdrawal of strawberries or cucumbers and reappear when those foods were consumed by the infant's mother. By eliminating from the mother's diet foods to which an eczematous infant was found sensitive by passive transfer tests, it is possible to control the eczema in a few instances. Of course, here we must rule out any lactalbumin or casein sensitivity. If we could do the same with cow's rations provided some cereal is a factor, or provided we furnished milks from a controlled diet, perhaps we might expect a reduction in the incidence or severity of infantile eczema.

Regarding evaporated milk in eczema, clinical experience disproves it to be a panacea. Commercial propaganda attempts to sell that idea.

Cutaneous tests are, I feel, worthless in eczema. They show either too much skin sensitivity or none at all. Likewise I feel that the much more informative intracutaneous tests are not without some danger and often are of no real value there. While a history in addition to the routine thorough pediatric one is necessary and valuable, the best means of getting results in eczema is by passive transfer tests. The serum is obtained under sterile precaution and no Seitz filter used.

In my hands that method is inducive of much success in caring for infants and children who have eczema, be it slight or severe. It is unfortunate that many pediatricians place reliance upon scratch tests alone. Those tests really only scratch the surface, figuratively speaking, and most generally give very little positive information. Their chief virtue is to pave the way safely and sanely for intracutaneous tests, after a negative scratch test is obtained.

More and more we find that inhalant substances, such as cat hair, chicken or goose feathers, pollens, and so forth, are etiologic factors in eczema in infants. I recall several infants with eczema who had flare-ups

from inhalant substances. Infants who have eczema under reasonable control will often have a flare-up when a new tooth is about to erupt. This I have often predicted to mothers who later verified my opinion.

While orange juice is not a frequent factor in infantile eczema, it surely is a clinical one in other types of allergy and, as we know, allergy often coexists in several forms. In five hundred pediatric cases where there was an intolerance in fifty instances to orange juice, that number occurred only twenty-five times to ascorbic acid. Thus there is sensitivity to the synthetic product, but it is prevalent only half as often as to the natural fruit juice.

Avoidance of hospitalization in wards is wise in infants with eczema. Likewise, where that condition is prevalent, smallpox vaccination should be avoided.

The use of antigens for an associated allergic condition is in my experience usually best avoided at least until the eczema has been controlled for a reasonable period of time.

When introducing a new food to an infant having eczema, only single foods should be given and then with first an interval of five days and then three days. Such an interval allows us sufficient time to watch for any unusual or allergic conditions. Again may I emphasize the fact that infants with eczema or any allergic condition should avoid mixed products as fish oil, cereals, and vegetable soup.

Dr. Edna S. Pennington, Nashville, Tenn.—In treating infants under 3 months of age, Dr. Bain could do no more to protect her patients against offending allergens, regardless of the results of skin tests. She neglects no possible offending allergen in her diet and management. She eliminates the possibility of ingesting any causative agent, providing a substitute not before ingested for every food the infant uses, cod liver oil, orange juice, and finally milk.

She also routinely eliminates all inhalants which usually cause trouble, that is, silk, wool and feathers, and although these are not mentioned, probably dust and animal hairs, where these are present. She removes every known contact allergen with care and diligence, carrying the infants in a sheet and using only well-washed cotton clothing. She also forbids all ointments and external applications except those prescribed.

In my practice I see practically no infants with eczema prior to 1 year of age, probably because they are satisfactorily handled by their pediatricians. I do see some older children with eczema and other allergies, many of whom give a history of eczema beginning before 1 year of age.

In children older than 1 year of age I would rely perhaps more on the skin test as an aid in diagnosis than Dr. Bain's paper would indicate that she did. I do not doubt, however, that she skin tests the older children as exhaustively as necessary to obtain a diagnosis. To substitute skin testing for patient and detailed history taking and careful observation would indeed be a poor trade; for whether or not reliance is placed on skin tests, we all know that the final clinical diagnosis must be made by trial of food and inhalant elimination, and the subsequent adding of these suspected allergens to diet and environment. In infants under 6 months of age especially, so few foods and environmental factors are involved that trial by elimination of the factors involved is relatively simple.

I should like to ask Dr. Bain if she does not repeat intradermally her negative scratch with milk. Even in testing intradermally we find that milk gives a false negative more commonly than any other food in both adults and children, and it seems probable the scratch test would be of much less value. We rarely see a positive scratch test to milk in any of our patients who, of course, belong mostly in older age groups.

I should like to ask her if she tests her patients with the trichophytin and oidiomycin extracts. This fungus sensitivity which we find to be a considerable factor in the eczemas of adults and slightly older children might be a factor even in small children.

Although Dr. Bain has eliminated inhalant allergens routinely, silk, wool, feathers, she has not seemed to give any great degree of credit for improvement to this removal. In the skin tests which we do on small children we find almost universally positive reactions to one or more of these inhalants, and more often than not these give the largest skin reactions. We also feel that their removal and often hyposensitization to them produce improvement or clearing of the eczema.

Like Dr. Bain, however, we employ other measures, usually at the same time, as we, too, feel that the most important thing is to cure the patient.

It appears to me, nevertheless, that at least some of the cures which she attributes to milk removal might be due to her careful elimination of inhalants as well as contact allergens.

While I cannot agree with the opinion that eczema is a skin condition only and should be treated primarily or only as a skin condition, I think allergists must recognize that they are dealing with a skin condition in which local treatment is important. Leaving off irritating or sensitizing applications is especially important, but it is not to be denied that, in many instances an application of mild coal tar ointment will clear up an apparently atopic eczema when the most zealous allergic management has failed.

Dr. Boen Swinny, San Antonio, Tex.—I have always entertained the fear that because of the atopic potency of soy, the use of soy bean milk in infancy would possibly sensitize the child to the bean family, which of course, is a large and important food element. I should like to ask Dr. Bain what has been her experience in the development of soy bean sensitivity with the milk preparation she has been using.

Dr. R. C. Miller, Gastonia, N. C.—I would like to ask Dr. Bain whether in the treatment of cases of intractable eczema that have died of some intercurrent infection and were autopsied, malformation of the intestinal tract was discovered?

Dr. William F. Mitchell, Columbus, O.—Dr. McGee said that treatment with other allergens (exclusive of foods) seemed to make the children worse. Since no one else has objected to this statement, I should like to say that we have always felt that treatment with other allergens was definitely helpful for the eczema. If there are any definite opinions on either side of this question, I should like to hear them discussed.

Dr. Oscar Swineford, University, Va.—Within the past year or so I have seen three patients with eczema from the starch that was used by the laundry in the preparation of bed linen. The laundries use about ten

different starches routinely in the preparation of sheets, shirts, collars and pillow cases. I think therefore that the sheets and all other linen used by these infants and other patients with eczema should be carefully rinsed free of soap and should not be starched.

Dr. C. B. Bohner, Indianapolis, Ind.—Dr. Bain said that she had seen children who return later with asthma and vasomotor rhinitis. I should like to ask her whether the children in the interval had been kept off the foods to which they originally were found sensitive; in other words, once we find a milk-sensitive individual, is he to be kept off that food for the rest of his life, or is it her experience that he does gain a tolerance to that food as he grows older?

Dr. Alan Cazort, Little Rock, Ark.—Dr. Bain mentioned that about 25 per cent of these infants develop dermatitis before they are one month old, while a large number of them are taking only mothers' milk. I should like to know her experience in eliminating from the mothers' diet those foods which we consider most highly antigenic.

My experience with this condition is slight, but a striking case seen several years ago stands out in my memory. The child was very sensitive by skin test to egg, but had had no other food than breast milk. It was one of those phenomenal cases that healed in only a few days, after egg had been eliminated from the home as well as from the mother's diet. This child was thought to have died later, at 1½ years, from asthma induced by the egg in a cookie.

Dr. Bain (closing).—In answer to Dr. McGee's question on passive transfer: for years we did passive transfer on all cases of eczema because we were interested in the results, but we found that from a practical standpoint we got very little. We found positives, of course, but the work involved did not bring in returns that were worthwhile in young infants, that is, children of 3, 4, 5 or 6 months of age. In older children I think perhaps it is more valuable.

In reply to Dr. Pennington, we do test all of our older children. It is with infants that I feel we are wasting time. We test infants because we are interested from an experimental standpoint, but I do not think you get enough out of tests in young children to make it worthwhile as a practical measure. All the older children are tested and from these tests one gets a great deal of information.

As far as the intradermal test for milk is concerned, Hill has been interested in that, and says you can of course get a positive intradermal without a positive scratch test, but in the cases with a positive intradermal test to milk he gets no larger percentage of cure by removal of milk than in those with negative intradermal tests. He does not know how specific it is, in other words.

On the question of fungus reactions, I am afraid we do not do as much as we should, especially with older children. How much fungi are involved in eczema of infancy I do not know.

I think the next question was that of Dr. Swinny on the question of sensitization to soy. That is always brought up, but we have seen it very rarely. I have always been afraid of it and I was always sure it was going to happen. Maybe we have had good luck, because it has not happened very frequently.

As to the question about autopsies, infants with eczema do not die. You seldom find a severe eczema dying and coming to autopsy. It is almost an unknown thing to have happen.

Another question that was asked was whether a child taken off a food stays off of it the rest of its life. Our practice has been to put a child back on a forbidden food a little at a time as he could take it. A patient was a case of severe milk-sensitivity who cleared beautifully off milk. At intervals we began milk and found at 6 years of age she could take it in small quantities not to exceed a certain amount.

In reply to the question concerning the relation between the diet of a case of infantile eczema and the production of later asthma or hay fever, I do not believe such a relationship can be shown to exist. Patients with asthma or hay fever do not have it because of the things we gave them to eat when they had eczema. Those with asthma come in because of inhalant sensitivity and those with vasomotor rhinitis have pollen sensitization, not offenders which originally caused their eczema.

Dr. Cazort's question related to elimination of food from the mother's diet. We always try it and are always disappointed. I have seen an occasional case improve when egg was removed from the mother's diet. I think that is the only elimination from the mother's diet I have seen succeed, and that only occasionally.

OBSERVATIONS ON ATOPIC DERMATITIS*

By LESLIE M. SMITH, M.D., F.A.C.P.
and
RAYMOND P. HUGHES, M.D., M.Sc.
El Paso, Texas

Atopic dermatitis of adults, or disseminated neurodermite, presents a problem which tries the skill and patience of dermatologist and allergist alike. Too often it is approached from one narrow viewpoint or another and sight is lost of the background and the complex nature of the disease. It is with the idea of emphasizing the picture as a whole, and of attempting to evaluate the different factors involved in its genesis and the various methods of therapeutic approach, rather than of adding anything new or original, that we present this paper.

Beginning, as it often does in infancy, with an atopic family history, and associated with other atopic diseases in the patient, many have regarded it as purely atopic and have studied it and treated it from that viewpoint alone. The results have been most often disappointing.

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On the other hand, purely local treatment, while it may result in disappearance of the lesions, does not permanently cure the disease.

We feel that our best results in atopic dermatitis have been obtained by studying the patient from several angles and endeavoring to determine what factors were important in each case.

Several investigators, notably Stokes[1] and Becker,[2] have called attention to the factor of emotional instability and strain as a part of the background of the atopic dermatoses. Possibly it plays a role in all the atopic diseases; at least it is a prominent feature in many cases. We have observed some evidence of instability in a sufficiently large proportion of our cases of atopic dermatitis for us to regard it as an integral part of the syndrome in most cases, and not as a coincidence. Exacerbations of dormant lesions have been observed repeatedly following unusual emotional strain. For example: a physician who had a healed flexural atopic dermatitis developed a severe exacerbation following financial reverses. A highly emotional young lady patient of ours with a generalized atopic dermatitis which had healed after much treatment experienced a marked return of the dermatitis immediately following marriage. We could give many more such examples of the effect of emotional strain in these cases.

It seems to be the general experience of dermatologists that in the large majority of cases one does not cure atopic dermatitis by dietary restrictions, either based on skin tests or by elimination or test diets as suggested by Rowe. This, in general, is our observation also, but there have been a few notable exceptions. We cite a case of a nervous, busy Mexican lawyer with a lichenified dermatitis of the face and backs of the hands of thirty-five years' duration which had been impossible of cure by local applications, x-ray, and calcium therapy. On elimination diets the lesions rapidly cleared up. Short exacerbations occurred following the addition of wheat and of milk to his diet. On a proper diet he has kept free of dermatitis, although his disposition and occupation are such that he is continually under more or less pressure, and his environment the same as for many years.

We wish to stress the importance of inhalant allergens in these cases, and especially of the house dust of the patient's particular environment, containing as it does many of the elements of that environment. It has been a rather striking observation in our experience that a considerable number of patients improve or clear up entirely on removal to another environment, that a good many react to skin tests with extracts of their house dusts, and that not a few improve on injections of the extract while remaining in their usual environment.

An illustrative case is that of a middle-aged women observed by us and by several allergists. She presented a chronic pruritic thickened dermatitis of both hands which was at first thought to be of occupational origin (housewife). Protection of the hands, local treatment, and a moderate amount of x-ray failed to relieve the condition. The patient was under considerable strain for several years due to financial reverses. She suffered from hay fever. Her skin reacted to a number of food extracts, the elimination of which did not clear up the dermatitis. Here was the familiar background of atopic dermatitis, namely, nervous strain and allergy. During a vacation on the coast the condition practically disappeared, but recurred some time after returning home. Skin tests showed a marked positive reaction to her own house dust, and continued efforts at desensitization have kept her practically free of trouble for several months.

It seems reasonable, and it is borne out in our experience, that so-called atopic dermatitis or neurodermite is neither purely atopic nor purely neurogenic in origin, but that the type of constitution which permits this condition to develop is the type which is hypersensitive mentally and subject to nervous and emotional strain, and hypersensitive in its cutaneous vascular system and consequently subject to the harmful effect of various allergens. These two factors, which are probably closely related, are apparently the principal ones in the genesis of atopic dermatitis, and they seem to vary in importance in individual cases. In one case the emotional factor and in another the allergic factor is of greater importance.

In the proper management of these cases we feel that we should first take stock of the general make-up of the patient, his or her heredity with regard to emotional stability, the occurrence of business and domestic unhappiness and the patient's reactions to these, financial reverses, thwarted ambitions, the patient's energy in relation to requirements, interest or lack of interest in work. Often some marked source of annoyance can be ascertained to which the patient does not, on account of his or her mental and emotional make-up, become adjusted.

Every effort should be made to show the patient the points of greatest strain and to help

him to eliminate them or adjust himself to them. Vacation trips with change of scenery and climate, development of hobbies and interests outside his regular vocation, cultivation of the habit of relaxation have all been of benefit in these cases. Mild sedation for a limited time may be necessary in some cases.

The family and personal history of allergic diseases should then be examined and efforts made to determine any specific allergens, food or inhalant to which the patient is sensitive.

The mechanism of allergy and the reason why certain individuals develop altered reactions to various substances is an intriguing study, but as yet most of the questions remain unanswered. Aside from the effect of heredity and emotional strain the chemical approach has been most popular. Changes in the hydrogen ion concentration in one direction or the other, changes in the sodium-potassium ratio, attempts either to neutralize the histamine-like substance thought to be responsible for the pruritus and consequent skin changes, or to build up tolerance to it, efforts to raise the blood calcium, all have been tried with varying degrees of success. Our experience with these various methods of approach does not justify an accurate evaluation of them, nor does the combined experience of all. We wish, however, to mention briefly some of our experiences in the hope that they will stimulate a general discussion of similar experiences.

The administration of alkalies has become such a fad that the patient has usually thoroughly tried it before seeking professional advice. If it has been of any service in atopic dermatitis it has been outside of our experience.

On the other hand, hydrochloric acid therapy has been of definite value in some cases. The beneficial effect of hydrochloric acid in these cases may be due to any combination of the following actions: as an aid to protein digestion, a pancreatic stimulant, an intestinal antiseptic, a necessary factor for the absorption of calcium from the intestine, and as a factor in the blood hydrogen ion concentration. We have administered hydrochloric acid in many cases of atopic dermatitis, often without the guide of gastric analysis. It is usually well tolerated. In a few it has been of striking benefit. In a young woman with a very resistant lichenified dermatitis of the backs of the hands and eyelids whom we treated in cooperation with an allergist the lesions could be controlled at will with large doses of dilute hydrochloric acid. Elimination of allergens seemed secondary in importance to the administration of the acid. Doses up to seventy drops three times daily have been administered, and only so long as this treatment is continued does she remain free of dermatitis.

Following the comparatively recent work on the sodium-potassium relationship in edema, and the application of this to the treatment of hay fever and asthma by Bloom,[3] and urticaria by Rusk and Kenamore,[4] and Cohen,[5] we began prescribing a high protein, low sodium, acid ash diet with the administration of potassium chloride in atopic dermatitis. Of twelve cases so treated none appeared to be benefited.

Following the somewhat encouraging early reports on attempts to detoxify histamine in the tissues by administration of the enzyme histaminase, this substance has been used extensively in the various atopic diseases. Recent reports, among them those of Miller and Piness[6] and Laymon and Cumming,[7] based upon greater experience, have not been favorable. Miller and Piness' report contains five cases of "allergic dermatitis," without relief in any. We have treated eight cases of atopic dermatitis with histaminase, some with and some without other treatment. The usual dosage has been thirty to forty-five units daily. In two cases there was improvement which we felt could be attributed to the histaminase. In one of these the effect was striking. In all others the results have been negative. We are not ready to discard the use of histaminase, and feel that further work, and possibly adjustment of dosage, are justified, especially in view of more encouraging results obtained in some cases of chronic urticaria.

Injections of increasing doses of histamine solution in an attempt to increase the tissue tolerance to this irritant have met with varying degrees of success. Our method at present is to begin with a 1:100,000 dilution of histamine phosphate and increase gradually to a 1:1,000 dilution, administering it intradermally. Our experience with this substance in atopic dermatitis has been limited, but we have one severe generalized case in which we have cleared up two attacks of the dermatitis principally by injections of histamine. We realize, of course, that this one case proves nothing and that much work must be done before any attempt at evaluation of histamine can be made.

Patients with atopic dermatitis are often advised to seek a complete change of climate for various reasons. There is no climate in which a person may not have this condition. It is prin-

cipally the change of environment and the relaxing effect of a vacation with freedom from responsibilities which are responsible for the benefit, if any follows such a change. Indeed, all such patients do not benefit by the change. If a change of climate is advised, as complete a change as possible should be made, and a place should be selected where rest and relaxation are assured. Undoubtedly a climate with an abundance of warm sunny weather is desirable and the effect of heliotherapy in promoting calcium metabolism and diminishing irritability is unquestioned. During the last few years a number of patients with resistant cases of generalized dermatitis have come to El Paso and vicinity from the East and have cleared up, apparently as a result of heliotherapy, usually self-supervised. Some of these were apparently cases of severe atopic dermatitis, but the majority, we believe, fall into the group of exudative chronic discoid and lichenoid dermatitis described by Sulzberger and Garbe.[8] Other cases of resistant, typical atopic dermatitis have come from the same localities and have been just as resistant as they were at home. In true atopic dermatitis we feel that too much stress should not be placed on the change of climate, but rather a complete change of environment should be sought.

SUMMARY

Atopic dermatitis of adults, or disseminated neurodermite, apparently is brought about by two principal factors: an unstable nervous system reacting to emotional strain and atopy. These factors vary in importance in individual cases, and an attempt should be made to determine the relative importance of each factor in each case. Lessening of the nervous tension by change, by recreation and hobbies, and elimination of exposure to the food and inhalant allergens to which the patient is sensitive should be the goal of treatment. Appropriate local and systemic treatment is useful in clearing up the attacks of dermatitis, but for anything like permanent relief the treatment must be on a much broader basis. Usual routine treatment is not discussed in this paper, but the effect of acid therapy, attention to the sodium-potassium ratio, histaminase, histamine, and climatic therapy are briefly considered.

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DISCUSSION (*Abstract*)

Dr. Winston U. Rutledge, Louisville, Ky.—I feel that I should re-emphasize Dr. Smith's statement regarding the complex etiologic background of this entity.

Many of these patients are first seen by the dermatologist after they have become thoroughly discouraged by the long duration of their trouble, and the repeated failures of others permanently to improve their affliction.

In such cases the successful dermatologist may well qualify for the definition of a genius who has been defined as a person with an infinite capacity for details. For in these cases only the most painstaking investigation and analysis may at last uncover the long obscured cause, the correction of which will bring about a permanent cure.

The familial background, constitutional, emotional and vascular instability, hypersensitivity to food, inhalants, bacteria and fungi, and the existence of obscure foci of infection are all causative agents whose importance is well recognized by all of us. But getting down to bedrock in the case of any particular patient, and actually determining which of these factors is directly responsible for his individual condition, requires the most searching and careful history, physical examination and laboratory check-up, followed by the most meticulous care in putting into effect those remedial measures suggested by the preliminary findings.

In these days, when the tempo of life has been geared up to a nervous and emotional pitch, it is surprising to me that more of us do not succumb to this cutaneous acknowledgment of defeat.

In many instances where increased rest, relaxation and hobbies and general supportive measures are not sufficient to accomplish the task imposed upon them, the proper utilization of chemicals, ferments, hormones, vitamins, diets and specific desensitization may be necessary to bring about a successful outcome in any particular case of this type.

The familial background may not be altered, but the mode of living, the acid-base balance and ion concentrations in the body may be changed to some extent, while the supplementing of endocrine and vitamin deficiencies, elimination diets, specific desensitization and the judicious use of topical application will often do much to offset the principal unalterable factor of heredity.

The investigations of Lancaster on the role played by estrogenic hormones in the control of light sensitization and exhaustion urticaria, the theory of Garretson that all allergic individuals have an endocrine imbalance

dependent upon thyroid and adrenal secretion, the work of Keining and Hopf on the use of an equilibrated salt diet in the treatment of allergic conditions, the statement of Cornelius Rhoades that a vitamin C deficiency stimulates allergic tendencies, and the work of Sulzberger, Goodman, Feinberg and others on seasonal atopic dermatitis due to inhalant allergens are all illuminating recent contributions to a final understanding of this complex problem.

Dr. Martin F. Engman, Jr., St. Louis, Mo.—Atopic dermatitis or chronic disseminated neurodermatitis is a disease of particular interest to us at the present time. Very little is known about it of fundamental importance. There are many theories as to its etiology, mostly of allergic nature. Even if one accepts allergy as an explanation of the disease, nothing is explained, since little is actually known about allergy.

About three years ago Engman, Sr., was given a grant for the study of this disease. After much thought and discussion we decided to study the electrolytes of the skin in chronic disseminated neurodermatitis as compared to a similar study of normal skin. The methods used were histospectography and microincineration. A preliminary report of this work has been recently published in the *Archives of Dermatology*. There was a control series of about a hundred normal skins. We have studied so far about thirty cases of chronic disseminated neurodermatitis. In the latter group biopsies were taken not only from areas of diseased skin, but from each patient's normal unaffected skin as well.

We obtained some startling results. The most striking was a marked deficiency of magnesium in the skin of these patients, not only where neurodermatitis was present, but in their normal skin also. In addition there are some suggestive histologic differences in these cases as compared to the skin of normal people.

We have not progressed far enough in our work at present to offer explanation for our findings, but we hope that these studies may help to throw light on this confused problem.

Dr. Robert Brandt, Augusta, Ga.—For some time I was interested in constitutional questions in dermatology, and I used anatomical details as well as the reactivity, especially of the skin, to characterize the patients. In neurodermatitis we found a much larger percentage of physically abnormal persons than in any other group of skin diseases. This was also true for mental abnormality. In some respects the latter is the cause of neurodermatitis entirely or partly, but sometimes it is only a sign of an abnormal constitution.

Sometimes, if we obtain a positive skin test to a certain material, we think it must indicate the cause of the disease in that case, but it may demonstrate only the ability of the individual to form antibodies. There exists a very interesting observation in children. Children with eczema (as the beginning of neurodermatitis) are apt to be allergic to egg white. Moro, in Germany, thought that all of these cases could be cured by cutting out egg white. Sometimes in children antibodies against egg white can be demonstrated by serologic tests (Moro, György and Witebsky), but if you abandon egg white in the diet of the children they are not always cured. So we took these serologic tests only as an indication that the child is able easily to form antibodies as a sign of an abnormal disposition.

Dr. Smith (closing).—I did not mention, partly for lack of time and also for lack of experience, the use of theelin, which was in a case or two of marked benefit, as Dr. Lancaster has suggested in his sunlight cases in women. I think theelin should often be tried, in these older women especially.

Whole blood injections, high vitamin intake, thyroid administration and a number of other things are of benefit at times, just as Dr. Rutledge said. There is not only a complex etiology, but a complex treatment, and we have to try many things. My experience has been that after trying all of these things we find cases that do not improve, and that is when we send them to a different climate.

FURTHER OBSERVATIONS OF CYCLOPROPANE FROM AN ALLERGIC STANDPOINT*

By RUSSELL F. BONHAM, M.D.
Houston, Texas

A little over two years ago in a paper on "Cyclopropane From An Allergic Standpoint," the writer named and described anesthetic allergy. Since that time, no one has disproved his idea so he ventures these further observations.

The detailed repetition of the definition, history, characteristics, technics of administering cyclopropane, and so on, and the elementary description of the allergic status are omitted in this paper as they have been amply described in previous publications.[3 4 6] They will be referred to here but briefly.

While allergists agree that 7-10 per cent of the people of the United States have respiratory allergy, it is noted that in some localities it is more prevalent than in others. In the writers' locality it is very prevalent and even the lay public has become allergy conscious.

Anesthetists also are becoming allergy conscious, especially if they are allergic. This is true in the writer's case since he has both hay fever and asthma every fall and winter. Allergy is a condition of unusual or exaggerated specific susceptibility to a substance which is harmless in similar amounts to the majority of members of the same species. The dyspnea seen during the anesthetic may be produced by either of two different reactions to the gas: first, a specific response which consists of spasm of the bronchiolar muscles; second, as a trigger or precipitating

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factor in patients suffering from atopic asthma which is due to a specific protein sensitivity.

Bronchiolar spasm produces acute dyspnea, and may be precipitated by a specific drug. The exudative type is the more commonly seen atopic asthma which may be precipitated, in the presence of exposure to the specific atopen by a trigger mechanism such as inhalation of a heavier atmosphere, for example cyclopropane. This latter type has been amply described by the writer.[4]

In the past two and one-half years the writer has observed that many patients have asthmatic dyspnea (inspiration short and labored and expiration prolonged) and diminished respiratory excursion while taking cyclopropane. They also have edema of the conjunctivae and face and larynx of varying degrees and the usual rise in blood pressure but no exudate or mucus in nose or throat. Hence many of the slides taken from nose and larynx and stained for eosinophils were negative. This led the writer to feel that perhaps he had not been careful enough in obtaining or staining his slides, but after careful reasoning and discussion of the matter with an allergist he concluded that in acute asthma or bronchiolar spasm, there would not necessarily be eosinophils in secretions as early as that precipitated by cyclopropane anesthesia. Furthermore, the writer observed that many of the so-called dry cases (when relieved and postoperatively) had no cough, exudate, or other sequelae.

However, they might have secretions if not relieved of the allergy but allowed to go on straining with their respiration long enough. Furthermore, it is easily possible, as the writer pointed out in his previous paper,[4] for the patient to strain to the point of hemorrhage.

These cases will naturally strain more and more as their respiratory excursion is diminished, as in any case of asthmatic dyspnea. Furthermore, they quite often will go through a rather prolonged excitement stage of the anesthesia, a longer time being required for them to settle down to surgical anesthesia and their postoperative reaction often being prolonged. This is true, of course, if the anesthetist cannot relieve the allergy soon after its onset and keep it under control thereafter. While these are purely clinical observations, it is reasonable to believe them to be due to a narrowing of bronchi and alveoli and hence a diminished absorption area. It is also reasonable to believe this condition predisposes to pulmonary edema in the exudative type or atelectasis in dry cases, as Buford and Jones[5] have reported.

When this edematous condition of the lung occurs and the alveoli and bronchioles are narrowed, naturally the absorption rate is directly diminished. The rate of flow of gases through these narrow orifices is proportional to their density and molecular weights. Cyclopropane, having a greater density and molecular weight than air, naturally would have greater difficulty in passing through.

Many allergic patients are made worse when forced to breathe a heavier atmosphere, and conversely, breathe better if the atmosphere is lighter.

If cyclopropane is considered purely as a trigger mechanism for precipitating allergy, it would seem logical to add a diluent to the anesthetic mixture. For this diluent the writer[6] recommends helium in mixture with oxygen, about 20 or 25 per cent oxygen to 75 or 80 per cent helium as described in his previous publication.

Barach[1] has described the treatment for pulmonary edema with helium and oxygen under positive pressure. He[2] also has shown by experiments and x-rays:

> "Breathing atmospheres under positive pressure possesses the physiologic advantage of maintaining a larger bronchial lumen, especially during the expiratory cycle, and thus promoting a more efficient emptying of the alveoli of the lungs."

Consequently, in allergic cases, the writer has instituted slight positive pressure in addition to diluting the mixture with helium with very gratifying results. This treatment is also useful in resistant cases or in laryngospasm.

Of course, some cases of mild allergy, laryngospasm, and resistant cases usually will settle down and do very nicely when once relieved after the initial induction. The more severe ones or true allergic cases will immediately return to a state of allergy when cyclopropane is again added to the anesthetic mixture. Sometimes the condition is relieved if the mixture is merely diluted with helium and slight positive pressure applied but in the more severe respiratory dyspnea or allergic syndrome, the bag is dumped of its anesthetic mixture completely and filled with only helium and oxygen; then positive pressure is applied until relief is obtained. If an allergic attack is again precipitated by the addition of cyclopropane, this anesthetist usually shifts to some other gas such as ethylene or ether. Of course, the open airway is used freely, and in some cases the endotracheal tube, to re-

lieve all obstructions, in order to give as free and easy respiratory effort as possible.

With your permission a few cases will be cited in detail:

Case 1.—Mrs. S., aged 33 years, a white woman with a history of asthma, came to the operating room, January 4, 1938, for a pelvic laparotomy. Her blood pressure was 110/70; heart and chest were normal. Hay fever and asthma were not active at the time. Induction was begun with cyclopropane-oxygen and in six minutes she began to "crow" and wheeze. An airway was inserted with no improvement. She was shifted off of cyclo-oxygen to ether, which aggravated respiration. I gave helium and in seven minutes respiration was normal; added cyclopropane and she began again the asthmatic respiration. I then shifted to ethylene and the patient withstood the operation, one and one-fourth hours, nicely. Her postoperative condition was good, there was no postoperative nausea, and recovery and convalescense were uneventful with no pulmonary complications.

Case 2.—G. P. S., aged nine years, son of the patient in *Case 1*, with a history of hay fever came to the operating room October 2, 1940, for herniorrhaphy. His heart, blood pressure and chest were normal. There was no hay fever or asthma at the time. Because of his history and his mother's record, induction was begun with ethylene-oxygen and it was very smooth and easy. After about twenty minutes the ethylene cylinder ran empty, so cyclopropane was added instead. After eight minutes of cyclopropane, the patient began to wheeze and show diminished respiratory excursion and edema of the conjunctiva and face. Helium was added under slight positive pressure with considerable relief, but it was thought even then that possibly some allergy persisted. His postoperative recovery was uneventful.

Case 3.—Mrs. R. H., a white woman, aged 27, came to the operating room, August 19, 1940, for a vaginal plastic. Her heart, blood pressure and chest were normal. She had a history of hay fever, however. Induction was with cyclopropane-oxygen and after some three minutes she began to strain and showed diminished respiratory excursion but also was resistant. Consequently the induction was much prolonged. After surgical anesthesia was established, she still had diminished respiratory excursion and seemed rigid. Ether was added with no improvement. Helium and positive pressure were added and continued through operation. Her allergy improved but was not entirely relieved. The postoperative reaction was also prolonged. The patient was hysterical for several hours before she could snap out of it and realize wakefulness. She had some excess mucus in her throat. A few days later she had a postoperative hemorrhage and had to be operated upon again. This time the anesthetic used was ethylene-oxygen with a little ether. The induction was smooth and rapid and she was completely relaxed and respiratory excursion was full and easy all the way. Her postoperative reaction was pleasant; she awakened in fifteen minutes with no excitement, vomiting or any untoward reaction. The duration of the first operation was forty minutes. The duration of the second was fifty-five minutes.

As time is too short to report more cases in detail, the writer would add that while the cases herein reported give a definite history of hay fever or asthma, many cases give a questionable or even a negative history.

Some of the wet cases were x-rayed postoperatively and the x-ray picture resembled pneumonia. However, the temperature was only about 99[2] and they all cleared up in six to seventy-two hours. The dry cases usually cleared immediately after the cyclopropane anesthetic was discontinued and the lungs were washed out with oxygen-helium. Some symptoms remained with the patient from one to six hours, however.

The first case with allergic symptoms was observed by this writer some four years ago as he has described in a previous publication.[4] At that time, however, he did not realize what the condition was nor how to cope with it. Consequently, while working in the dark and feeling his way, many cases were not recognized as allergic, and even at the time of reading his paper two years ago, many conditions had not been recognized. He wishes to apologize for not being able to give accurate statistics upon the incidence or percentage of cases in which allergy may be noted while giving cyclopropane. In looking back over some 2,000 cases in which cyclopropane was used during the past four years and in more careful observation of cases in the past year, he would say that definite allergy occurs in a very large number of cases, much larger than was at first supposed. The more familiar the anesthetist is with allergy and with this condition, the more easily he will recognize the symptoms of an attack precipitated by cyclopropane, even if it is mild. Of course, much work is yet to be done on this subject, especially in the chemistry and x-ray laboratories.

The writer would like to quote here a personal communication from Dr. E. A. Rovenstine, of New York City, dated August 13, 1940. Dr. Rovenstine has given permission for its use:

"We are convinced that the condition you have observed and described is one of bronchiolar spasm. It is, of course, more common in the type of patient who has allergic phenomena. We have demonstrated under the microscope and photographed a bronchiole of normal contour which, when perfused with cyclopropane, constricted to one-third or one-half its normal size. We have observed in a patient by means of a bronchoscope the actual constriction of the bronchus when cyclopropane was administered.

"We plan to report these findings some time soon and when the paper is completed I will send you a copy before publication. We will, of course, give full credit to your contribution and observations."

To summarize:

(1) Certain persons, when given cyclopropane, definitely become allergic or asthmatic and edematous.

(2) The patient may or may not give a definite history of allergy. However, the more severe cases did have a positive history.

(3) Of the two types of allergy, specific and nonspecific, in relation to the gas alone, the nonspecific or exudative types all gave a history of hay fever or asthma.

(4) The addition of helium as a diluent with slight positive pressure improves or relieves the allergy. However, in severe cases cyclopropane must be dumped entirely, and helium and oxygen given.

(5) The writer feels that cyclopropane not only precipitates allergy in the nonspecific exudative type, but also apparently causes definite bronchiolar spasm or specific asthma.

The writer uses helium-oxygen and positive pressure freely or even changes to another agent when he notes symptoms of allergy. Consequently, he has had no severe cases such as were seen in the early observations of allergy.

The purpose of this dissertation is to present principally the clinical findings and observations of the writer. He and his surgical associates are convinced that the allergic manifestations herein described are precipitated by or due to cyclopropane.

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DISCUSSION (*Abstract*)

Dr. C. W. Hoeflich, Houston, Tex.—I cannot use the word allergy as freely as Dr. Bonham does because, as he said, it has not been disproven but it has not been proven that patients are allergic to cyclopropane because he switches from cyclopropane to ethylene, both hydrocarbon gases.

I think it would be more appropriate if he used the term "more asthmatic conditions," because certainly in my own work, and I am sure all of you men have had the same experience in giving anesthetics, I have produced asthmatic breathing in allergic or asthmatic patients at a certain stage, and I can reproduce it again with any one of the agents that is used for an anesthetic.

Dr. Bonham has observed evidence to bear out his contentions, but we have not all observed the same thing. At least, I have not.

I started in anesthesia in the days when we used nitrous oxide. Then we got ethylene, which we thought was a wonderful gas. We have since switched to cyclopropane, and what would we do without cyclopropane now? I use cyclopropane routinely for all inductions for anything I have to have, unless a cautery is necessary, and then I switch to nitrous oxide.

The condition of bulging, swelling and redness of the conjunctiva is, according to my idea, produced by pressure of the mask. Sometimes we have to put on a good bit of pressure.

The term allergy is being used too freely. I have hay fever, and I believe I would develop asthmatic breathing if they gave me a form of anesthetic that got me to a certain deep stage. It is something to look out for, and it makes us more alert in handling cyclopropane.

I feel personally that if cyclopropane were taken away from us now and we had to depend upon the other gases, it would be most unfortunate.

One of our men produces an apnea intentionally. I get into that every once in a while, and I have not had any bad results from the apnea if I watch the patient closely. I have even given better anesthetics when I have produced an apnea, but I am frightened. I run them for quite a while without telling the doctor that the patient is not breathing.

It is the technic and the method and the way that every man is accustomed to doing his work.

Helium is great. It certainly helps the patient when asthmatic breathing is produced with any agent, besides reducing the danger of explosions.

Dr. F. W. Ratcliff, Lafayette, Ind.—I would like to ask Dr. Bonham what preliminary medication these cases have had. I am primarily interested in knowing whether atropine was used in each case. I would like to know if he feels that atropine would help to avoid or lessen the allergic manifestations.

Dr. Fred E. Woodson, Tulsa, Okla.—I concur with Dr. Bonham in observing allergic manifestations with cyclopropane. I also have observed allergic manifestations with other anesthetic agents, but more commonly with cyclopropane. In addition to the bronchial spasms, some patients will produce skin manifestations of urticaria, especially in the induction period, and after deep anesthesia the skin manifestations will leave.

Allergy as a branch of medicine is a new thing, and some of us who live in the section of the country where there is much dust in the air are probably more sensitive to allergic conditions than others, but a large portion of our population have allergic manifestations, and I think we should keep that in mind, especially

those of us who do general anesthesia away from scientific centers.

Dr. Hayes Gailbreath, Louisville, Ky.—I would like to ask if in these cases that are known to be allergic there has been an attempt to use preliminary medication like epinephrine to try to prevent allergic manifestations.

Dr. Bonham (closing).—I have noted allergy with other anesthetic agents, but I had not observed it until I used cyclopropane, or rather I had not thought of it. I see it now, but it is more prevalent with cyclopropane than it is with the other anesthetics.

Dr. Hoeflich referred to the fact that edema of the conjunctiva and face is possibly due to pressure from the mask. I do not think that is true because, when I use an endotracheal tube, it has occurred. I think that is a definite allergy. The first tissue that allergy affects is the mucous membranes.

There was a question about preliminary medication. Usually as a preliminary I give a grain and a half of pentobarbital the previous night, that is, if the case is in the hospital the day before the operation. I prefer a grain and a half at 9:00 p. m, repeated an hour and a half before the operation next morning, and then a half hour before the operation a third of pantopon with 1/150th grain of atropine. I believe in those cases that do not have atropine the mucus is worse than in those that do have it.

Of course, there are emergencies that are brought in where I give the anesthetic without having seen the patient. The patient is possibly in the operating room before I see him, and in such cases it may be that the surgeon has given only a quarter of morphine, and they do have more secretions, more mucus, than the others.

Dr. Woodson mentioned urticaria. I have noticed that, too, especially in the induction, and I mentioned in my paper allergy of a mild degree. I did not describe that, but I have definitely noticed it.

I do not give epinephrine or similar drugs if I am going to give cyclopropane. Dr. Waters pointed out a few years ago that epinephrine is contraindicated when cyclopropane was used, either as a stimulant before or after, as it definitely weakens the heart muscle. Therefore I would not recommend to give epinephrine or ephedrine or any of their derivatives for this condition until the cyclopropane had had time to be eliminated from the patient. I prefer to give helium and oxygen with slight positive pressure until there is relief.

In this paper I do not wish to condemn cyclopropane, the most useful anesthetic gas that we have. The purpose of this paper is to point out one of its dangers in order that we may combat it.

The nose and throat men use cocaine. Quite often they have a patient who is hypersensitive to it. They continue to use the drug, but they know the danger and are equipped to overcome it. The purpose of this paper is not to condemn cyclopropane. I still use it more than any other gas. I use it almost routinely on inhalation anesthetics, and I think that with the addition of helium for the treating of this condition we can overcome many difficulties.

AN OUTLINE FOR TEACHING ANESTHESIA TO PHYSICIANS OF SMALL COMMUNITIES*

By FRED E. WOODSON, M.D.
Tulsa, Oklahoma

The purpose of this paper is to stimulate interest in a need for teaching modern methods of anesthesia to physicians in small communities. Practically all organizations for the teaching of the science of anesthetology have been for physicians who are associated with large medical centers or large hospitals. There are thousands of small hospitals over the entire nation that are either owned privately or by municipalities. They have a small staff, sometimes as small as a half dozen physicians. A great majority of the anesthetics that are given in these hospitals are given by nurses or given by physicians who bring their cases to the hospital for the local surgeon to operate. In recent years there has been a trend on the part of physicians in these small communities to become interested in anesthesia as an adjunct to their practice, and a number of them have availed themselves of postgraduate training along this line. There are still a large number who would be interested if the teaching facilities were available closer to their home. The facilities that are available at present for physicians are:

(1) The various books that are printed of recent date on anesthesia.

(2) Articles on anesthesia in the various journals.

(3) Articles read on anesthesia at various state meetings and clinical society meetings.

(4) Postgraduate work at medical centers.

(5) Visitation and consultation at near-by medical centers.

The outline that I propose to make further

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*Read in Section on Anesthesia, Southern Medical Association, Thirty-Fourth Annual Meeting, Louisville, Kentucky, November 12-15, 1940.

facilities for teaching anesthesia available is as follows:

(1) The assembling of a simple handbook on anesthesia, which would give a summary of the physiology involved in the various anesthetic agents.

(2) A brief and concise discussion of the technic of administration of the various anesthetic agents, which would include the indications and contraindications.

(3) A visual educational program by films and slides to be produced and made available showing correct methods and technic. The production of this visual education to be done entirely from a teaching standpoint, rather than from a sales standpoint of the various anesthetic agents. The sales part will take care of itself.

(4) Demonstrations made available at various medical centers where physicians may come for visitation and consultation.

(5) To incorporate in the various state medical programs and clinical society programs addresses, lectures and demonstrations on various types of modern anesthesia. There might be a great deal of repetition carried out over a period of years, but a large number of physicians will have availed themselves of this training and development.

SUMMARY

I propose to this organization that a permanent committee be appointed to work out the details of such a program, and that this committee be appointed for a period of at least five years to be replaced and enlarged as a need develops. The function of this committee is to be entirely advisory. I propose then that this committee make an annual report to the Association as to the progress made by this group of physicians and hospitals.

DISCUSSION (*Abstract*)

Dr. R. Douglas Sanders, Louisville, Ky.—I wonder whether Dr. Woodson could outline a program. We should be very glad to sponsor something of this kind.

Dr. S. E. Williams, Chippewa Falls, Wis.—I know of no one who can do more to put through this anesthesia program, who has more the support of the Surgical Association, than Dr. Frank Lahey. He is an enthusiast in anesthesia, and he would help you put this across in your meeting as he is doing in our Tri-state or what we call the Post Graduate Association in our region.

THE ADVANTAGES AND DISADVANTAGES OF A CENTRALIZED DEPARTMENT OF MENTAL HEALTH*

By G. H. PRESTON, M.D.†
Baltimore, Maryland

Any physician who has worked in a state hospital knows that the hospital rides on the neck of the superintendent and that it never goes any further than the superintendent has imagination and strength to carry it. That makes the primary duty of a central administration very clear. It must allow scope to the superintendent's imagination and it must give him strength to carry on. If the superintendent must spend his time forwarding requisitions in triplicate, if he has no part in planning and developing his institution, if he must employ attendants and physicians assigned his hospital by a central bureau without opportunity to make any personal selection, then the central department is dangerously overpowerful. If, on the other hand, the central department cannot protect the superintendent from local political pressure, if it cannot prevent the appointment of unsuitable personnel, if it cannot arrange the distribution of available funds on the basis of the needs of individual hospitals, rather than because of the influence of a particular board of managers, then the department is too weak. These aspects of hospital administration have been adequately presented and are familiar to all of us.

There are, however, several other aspects of central control which are not quite so obvious. Of these I wish to present first certain problems which concern the relations between the state hospitals and the central office and then the vital and often totally neglected relationships between a state service and the private practice of psychiatry, both institutional and non-institutional.

It might be well to start with the matter of public good will. Any public service depends upon public good will and public good will is built upon what the public believes about the kind of work the department is doing. Part of this public good will develops from the way in which complaints about service are handled. We all know that state hospitals care for individuals who have succeeded in making nuisances

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*Read in Section on Neurology and Psychiatry, Southern Medical Association, Thirty-Fourth Annual Meeting, Louisville, Kentucky, November 12-15, 1940.

†Commissioner of Mental Hygiene.

of themselves in the community. Those of us who work in public offices know that our lives would be very much happier if our patients had no relatives. Unfortunately, they do have relatives and the handling of relatives is a very important matter, because it is one of the bases on which public good will rests. From the administrative angle two factors are important. The first of these is that the superintendent of a hospital should be given every opportunity to settle complaints.

In every case in which complaints are made the central department should try to return the problem to the superintendent. This should not be done by saying "I haven't got time to listen to you; take it up with the superintendent," but by taking time to explain to the relative that problems of care can be worked out more intelligently with the physician who is directly in charge of the patient. It is often wise to accompany such advice with a promise of help if the problem is not solved. This procedure is not purely one of administrative expediency. It rests upon the essential axiom that good psychiatric treatment is built on faith. If someone steps in over the superintendent's head, both the patient and the patient's family lose confidence and the patient suffers.

Any administrator learns to judge one phase of the hospital competence of physicians by the number of unanswered complaints which reach the central office, and the same relationship also exists between the ward physicians and the superintendent within the individual hospital. It is a commentary upon psychiatry that psychiatrists practice their art with patients and then forget it completely when they have to deal with relatives who may be just as sick as the patient.

The second important factor in the administrative handling of complaints is that there should be a sympathetic central medical authority to which families can appeal. This is the final protection against public ill-will and also a final protection against political pressure. It is all very well to say that politics have no place in the treatment of patients, but it is equally true that a non-essential favor granted a state senator as if it were a major concession may pave the way for improved treatment for many future patients.

Next in importance, as far as public relations are concerned, is the way in which the press is treated. The average physician is shy of newspaper publicity. Many state hospitals do not like reporters. Newspapers are published to sell and the public will buy stories of horror and mistreatment in state hospitals, or stories of miraculous cures by the use of some new drug. The only way to counteract this is to tell the papers the truth about what happens and to see to it that any story that can be of value to the hospital, and that is also news, is presented to the papers in a form in which it can be used. This is an important duty of the central department and the department should have sufficient control or cooperation to see to it that this policy is carried out by the state hospitals. It requires someone in the central department with a little news sense and some ability to present material in a form from which copy can be written.

Closely related to the matter of publicity is the duty that a central department has to compile statistical information in regard to the care, treatment, prevalence and future outlook for mental illness in the community. This compilation of statistics can be done only by a central department, but as in almost any other field of contact between an individual hospital and a central department, the central department can demand an impossible amount of useless work.

Requests for forms, reports and questionnaires must bear a practical relation to the many other duties demanded of a superintendent and must have some obvious value.

Care must be used because psychiatry has suffered from the most futile sort of statistics. To begin with, there are almost no figures as to the incidence of mental illness in any community. There are figures, collected all over the country as to the number of patients admitted to hospitals, but no one knows with any certainty what relation the number of these recognized and hospitalized patients bears to the unrecognized and non-hospitalized patients in the community. In the second place, diagnostic figures as presented in this psychiatric field are so chaotic and so unstable, so influenced by the training and even the personality of the diagnostician, as to be almost without value. Finally, almost all central departments of mental hygiene publish annual figures of admissions and discharges and deaths in which the admission figures relate to one group of patients, usually those admitted during the year, and the discharges and deaths to patients, some of whom have had a few days' hospital residence and others many years. Any attempt to draw from such figures information as to what happens to any particular group of patients is hopeless. There

are a few outstanding exceptions to this state of statistical fantasy, but they are relatively few and they point to the need for simple, usable figures in regard to mental illness. Any system from which useful figures can be obtained must include both private and public institutions and must be designed to record life histories and not cross sections of patients. It cannot be developed all at once, but must be built up over a period of years. It need not require any very elaborate equipment, nor be very expensive to operate. It should be the basis upon which every central department plans for the future, checks results, and prepares necessary publicity.

Nearly related to this matter of statistics is the relationship, or rather the lack of relationship of the state department of mental hygiene to the state department of health. This is one of the strange features of our work. One of the major public health problems has grown up almost outside the official public health field. The average health department, or the average health officer, is vastly more interested in malnutrition than in dementia praecox. This may be the natural result of the inability of anyone in the mental hygiene field to present any concretely applicable preventive program which can compare with programs for the prevention of typhoid, malaria or diphtheria, or it may be because the public health officers, even in the best schools of public health, are not trained to think of mental illness as a public health problem. In any case, a central department of mental hygiene has specific duties in this direction. There seems to be no very simple way of developing this relationship. Suitable statistical presentations might help. The health officer is trained to think epidemiologically and statistically and such presentations, if they can be kept up, should eventually arouse interest.

In another way the mental hygiene clinics can be made to serve a very useful function in building up relations with the health officers in much the same way that clinics for tuberculosis and clinics for crippled children have been used. Because of the fact that much of the work in mental hygiene clinics, particularly for children, has been done by social workers, because much of it has been little more than psychometric testing, and because a large part of the work has been done directly with educational problems, the medical and public health aspects of the work have been lost sight of. If the public health aspects of mental hygiene are to be built up, it is obvious that one way to do so is to associate mental hygiene clinics with the health officer and the public health nurses in the area served by the clinic. Demonstration in the community that the psychiatrist can help to solve acute medical problems with the use of facilities already existing in the community, without having to take the patient away to some not very clearly understood institution can be a very potent influence in breaking down the prevalent feeling that the psychiatrist is queer and that all that you can do with a mental patient is to "put him away."

The matters which have been discussed are important in relation to internal departmental administration, but there are certain much more important relationships which a central department must keep constantly in mind. The state department has a direct responsibility for the private practice of psychiatry in the area it serves.

In no other field has state medicine flourished so boldly and in no other field has the medical profession been so apathetic about the development of state medicine. One of the problems of a central department is to avoid destructive competition with private practice because, no matter how well a state service may develop, it can never go beyond the point at which it is supported by public opinion and public psychiatric opinion should be formed by an active group of practicing psychiatrists. At the present moment there is real danger that community psychiatric leadership will be assumed by social workers, child study groups, or lay organizations in general. The state departments must remember that their major protection lies in the hands of practicing psychiatrists and superintendents of private psychiatric hospitals.

There is a definite relationship between the treatment given patients in public hospitals and the standards of private psychiatric practice in the community, and the careful development of this relationship is one of the frequently neglected functions of a central department. As long as the state hospitals gave little more than custodial care to large numbers of patients, handled patients in groups, and were talked about as insane asylums, many families sent their relatives to private hospitals because of the better food, better living conditions and greater privacy. As the state hospitals have developed from asylums to hospitals, have built up clinical laboratories, surgical units, x-ray equipment, so that excellent medical service can be given patients, as they began to use malaria and in the last years to experiment with the much too pub-

licized "shock therapies," as they developed clinics which helped to adjust patients in the community after they left the hospitals, and as they built up home boarding care programs, the demand for more than good food and privacy increased. Few private institutions can compete with well run state hospitals in the treatment of medical or surgical emergencies occurring in patients suffering from acute mental illness, or in actual facilities for laboratory work, variety of occupational outlet, hydrotherapeutic equipment and matters of that type, but there is one field in which the private hospital stands almost alone, and which private psychiatric hospitals must develop if they are to compete with constantly improving public care. This is the matter of individual psychotherapy, the intimate therapeutic relationship between one patient and one physician. Here the state hospital can now compete only to a very limited extent, and any central department must lead the public toward a realization of the value of individual psychotherapy, because such individual therapy must be the ultimate aim of public institutions. In any attempt to reach this aim, the public service must lend its full support to any institutions in the community which are now able to provide such service. The formal inspections of private institutions which most central departments are required to make can be used to good purpose in encouraging progress in the weaker private institutions. Such inspections should not be inquisitions. Polite comment, casual comparisons and accurate accounts of the success of methods used in other places can be made a valuable part of inspections. Rigidity is only necessary when the law is being violated.

In this connection the practice of providing private or semi-private or special payment care in public psychiatric institutions should be given serious consideration. A state hospital should be able to provide a private room for a patient, or a surgical nurse, or a consulting specialist, but that should be done on the basis of the need of the patient and not because the patient's family is able to rent a private room or hire a special nurse. Such special privileges have no place in a public institution. The state hospital is better off if it has no financial relationships with the patient and if the hospital does not know whether a patient is a "pay patient" or not. Financial relationships are better handled by a central department, guided by one policy for an entire state.

In the matter of the private practice of psychiatry, the clinic programs developed either by individual state hospitals or by a central department are probably the most important factor. At the very beginning of any discussion of so-called mental hygiene clinics, it is important to say that the program is helpful rather than harmful to the private practice of psychiatry because of the psychiatric interest which it arouses. This is undoubtedly true of the clinics in the state of development which they have reached in most parts of the country and with the number of practicing psychiatrists as limited as it is outside the larger centers of population. It is nevertheless true that most of the so-called mental hygiene clinics are in fact not preventive service, but treatment clinics to which adults and children already needing psychiatric help are brought. The preventive functions and the educational aspects of the work are carried on incidentally and public support rests upon a basis of treatment. This any central department must keep in mind. Efforts must be made to see that every physician in the area served by the clinic who has any training or interest in psychiatry is brought into touch with the clinic and that as much as possible of the necessary treatment is done locally by practicing physicians.

Another aspect of state hospital practice should be mentioned here. Many state hospitals have been almost "closed institutions." The superintendents and the staff physicians have tended to feel that they knew best what the patient needed and have often resented the "interference" by outside physicians. This is gradually breaking down, to be sure more so in public than in private hospitals, but a central department which is interested in the welfare of psychiatry in its area will do all it can to persuade the practicing medical profession to come into its hospitals and reclaim some psychiatry from the field of public medicine.

The central department must never lose sight of the fact that the only hope of adequate psychiatric service to a community rests upon able and independently responsible superintendents, upon an informed public, and upon an active and interested medical profession. Any activities are dangerous if they threaten one of these three major objectives.

DISCUSSION (*Abstract*)

Dr. J. G. Wilson, Frankfort, Ky.—Dr. Preston has very ably described the advantages of a centralized department of mental health, and the disadvantages he

mentioned could be more properly termed pitfalls into which the centralized department is likely to fall if it is not extremely alert.

We are all agreed that "the hospital rides upon the neck of the superintendent," and that whatever checks and balances may be provided in his method of selection of personnel, such restrictions should never be of such a character that he is compelled to employ anyone who is unsuitable for his job simply because of local political pressure. Many states have worked out this aspect of the question in a satisfactory manner, and many states have developed a centralized political pressure machine at the state capital to exert indirect pressure upon the centralized mental health department, thus creating a situation fully as bad, if not worse, than when the pressure is disseminated locally.

The next point in Dr. Preston's paper which I wish to enlarge upon concerns his remarks about the danger which lies in the publication of statistical interpretations. I think there may be a tendency on the part of some superintendents to release crude statistical tables with interpretations which are unwarranted, and it is certainly a proper function of a centralized department to insist that it should review all such reports before their public release is authorized.

The point raised by Dr. Preston about the growth of specialized surgical and medical treatment in our state institutions calls for emphasis. There is, as he says, "A definite relationship between the treatment given patients in public hospitals and the standards of private psychiatric service in the community." Therefore, it seems to me, it naturally follows that the more and the better consultants in these specialties we have in our institutions, the more will the general medical profession be aroused to the fact that every case of physical illness has its psychiatric aspects. Thus, aroused interest on the part of the general practitioner and specialists will gradually be reflected in public opinion, and legislation will be demanded which makes it possible not only to give our mental hospital patients the best treatment possible, but also to insure measures for the prevention of mental illness comparable to those which every good physician puts forth to prevent his private patients from contracting physical diseases.

There are many other items ably dealt with by Dr. Preston, but the time limit is too short to discuss them, and I shall conclude by mentioning the one I consider most important of all, to-wit, the relationship which the mental health department should bear to the department of health.

It is true that health officers have, as Dr. Preston states, been vastly more interested in malnutrition than in dementia precox, but it is also true that the average state hospital physician has been more interested in dementia precox than he has in malnutrition.

Both the psychiatrist and the health officer have failed to grasp fully the fact that mental health is simply one aspect of public health, and that neither can work to the best advantage without the mutual help of the other.

I do not wish to go on record as saying that I believe the time is quite ripe for the state health departments to assume the responsibility for the mentally ill, now usually assumed by state welfare departments, but I do think the trend is in that direction and that eventually it will be the only logical solution.

The county health officer and the county health nurse know more about the actual home conditions of the population than any other organization. Their work in the public schools, in the syphilis clinics and prenatal clinics preeminently qualify them to furnish the data upon which a good social service case history can be compiled, and their recommendations are frequently as satisfactory as those of the trained social service worker. With a little aid and cooperation from the latter, satisfactory parole programs can often be worked out, and many cases of unnecessary commitments can be prevented.

We have recently started these cooperative relationships with the health department of our state (Kentucky) and believe it gives promise of satisfactory development.

In connection with the arguments pro and con for such a relationship, one must remember that in most states political interference with the activities of health departments is usually less than with mental hygiene departments. The public seems to be pretty generally convinced that the preservation of its physical health should not be entrusted to politicians. Now it is up to us to convince the public that the preservation of its mental health is as important as the preservation of its physical health, that the two are inseparably bound together, and that the men and women who are entrusted with these jobs should be chosen with no thought in mind except ability to perform the job.

Dr. Oscar B. Darden, Richmond, Va.—One cannot listen to Dr. Preston's paper without being impressed immediately with the importance of the subject. While other writers have dealt at some length with the type of administration of the mental health program in the various states, this is the most comprehensive treatment of the important role a central office should play in the mental health program within the individual state that has come to my attention. I believe we have paid too little attention to the type of set-up and to the functions of the central administrative office.

The general duties of the administration have been admirably discussed, and little can be added except by way of further emphasis. I should like to elaborate upon a few points somewhat, however.

There can be no question that central jurisdiction makes for uniformity in treatment, in statistics, and in records. Likewise, too much stress cannot be placed upon the influence the directing head plays in maintaining uniform staff personnel, selected according to definite qualifications, nursing staff, and general hospital outlay, particularly in reference to a long-time building program.

In the matter of research the influence of the administrative office is indispensable. Often it is the stimulating interest in research originating in the central office that arouses the hospital staff to undertake such work. The problems for research investigation, the allocation of funds for the work, the selection of personnel, and the cooperation of other groups, is not alone facilitated but often is made possible only through a central office.

The isolation of mental hospitals has always been an intriguing and interesting question. I have often wondered if our apparent desire for continued isolation were not, in part, a defensive residual feeling handed down from the old days of terrorism in asylums. The right

kind of publicity, released from headquarters, cooperation with public health physicians, outpatient clinics, and an interested medical profession, will go a long way in establishing the mental hospital as a virile force in the community, and allow it to take its place in the ranks of other health units.

A cooperative plan of activity that would be helpful, both to state hospitals and private clinical psychiatrists, can be worked out. There should be no question of destructive competition, and there will not be under a properly controlled program from a central office. Private practice should be regulated and supervised just as the state hospitals are. An equally relatively high standard should be required of private physicians, in or out of hospitals. In the preventive field, too, this condition should prevail in the establishment of mental hygiene clinics. But here again close supervision with mutual understanding as to limitations of work done by the clinics must be made clear.

Advantages of a working plan between central offices of various states are obvious, while the lack of a cooperative plan between those states in which no central office exists offers apparent handicaps. It is readily understood how a small group from the various states, interested in a program with the same objectives, is much more likely to compile statistics and records that have more meaning than individuals who change positions from time to time, and who may be interested in only one phase of statistical data. The mental health problem needs to be attacked from every possible angle with as great force as possible, and some plan of uniform activity by various states will offer a powerful attacking force.

I believe it would be well for this Section to foster a movement, in collaboration with a committee from the American Psychiatric Association, for the study of the entire question, both from the standpoint of the type of set-up and from the standpoint of the function of the central office in the individual state.

Dr. J. G. Wilson.—When I was attached to the National Committee for Mental Hygiene a few years ago we made a study which has never been published, but there is in the Committee's archives a complete recapitulation of the ways the mental hygiene departments of the different states function. It is there in great detail as of two years ago, and I fancy it has not changed very much since.

I must say that it is not quite so diversified as some of the speakers seem to think. There is a source of information that you can get if you care to write to the National Committee for Mental Hygiene requesting it.

Dr. David C. Wilson, Charlottesville, Va.—Dr. Darden suggested that there are about thirty-five different types of state administrations in this country. I think two or three have almost the same type. I believe your question the other night was as to why that was, and your answer was that it was because we do not know what kind we want. Dr. Darden has made the suggestion today that a committee be appointed from this Section to cooperate in some fashion with other psychiatric organizations to try to determine what type of central office would act as an ideal toward which we could all strive. If it is feasible, I should like to make such a motion.

Dr. Preston (closing).—I can close what I have to say with two or three remarks. In the first place, I was talking from the point of view of a free state. We have had, I think, practically no political pressure upon state hospitals in Maryland for something like three generations, so that I do not know at first hand anything about hospital superintendents who change with governors.

The statement about malnutrition and dementia precox, of course, is perfectly true. Certain state hospital superintendents have been more interested in dementia precox than they have been in things going on in the community. That is a changing factor. I believe that we are breaking down the isolation that Dr. Darden mentioned and swinging over into other fields outside hospitals quite rapidly.

As far as the research program is concerned, we in Maryland have been particularly fortunate in being able to get assistance in the state hospitals. I see Dr. Katzenelbogen here, who has been one of the people who has helped us tremendously on a volunteer basis on the outside in doing pieces of research work at various times.

As far as Dr. Darden's suggestion about cooperative planning between states, it seems to me that this is an important factor and it is probably particularly important for those states belonging in the Southern group and probably particularly in the Southeastern group. Maryland often is compared with New York and Massachusetts, and I have to remind speakers constantly that Maryland has a population about the same size as the Borough of Brooklyn and that the comparisons are not fair. A really different problem is presented by various sections of the country, not only on a population basis, but on the feeling of the community, the type of people with whom we deal, the traditions which underlie, and the whole process of doing business, and that there might be a very strong reason for cooperative planning among those states which look at their general cultural problems and methods of life from the same point of view. We are much nearer, in Maryland, the thinking of Virginia or North Carolina and South Carolina than we are the thinking of New Jersey, Delaware, Pennsylvania, and plans that are suitable for those states will not suit us; we can more nearly match Virginia plans or North Carolina plans. I do not know as much about Kentucky as I should.

Dr. Spafford Ackerly, Louisville, Ky.—Dr. Preston, I think it would be of interest to this group if you could tell us briefly about the methods of commitment in Maryland. A number of persons have asked me about it.

Dr. Preston.—I will start off by saying that our commitment laws in Maryland are probably unconstitutional, and add to that, that they work better than any plan I know of. Ninety-eight per cent of the patients in our state hospitals are there on the certificate of two physicians and nothing else. There is no court action, there is no sheriff, there is no anybody except two doctors certifying that the patient is mentally ill and that his illness is of such level as to require his care in an institution for mental patients. That gives the institution the right to hold the patient. That is subject to habeas corpus whenever asked, and in the state service we are aiming to make it as easy to get out of a state hospital as it is to get out of a general

hospital. That you never can quite reach, but it seems to me that we have kept a lot of people in hospitals, in fact I know we have, when there was no earthly reason for keeping them except our feeling that they might do something wrong, and when we turn them out they do not. The persons who get out of hospitals against medical advice do nearly as well as those who we say are ready to go home. The large majority of our commitment is on a simple matter of two medical certificates, taken, with the patient, to the hospital, plus a statement from the political subdivision that that patient is a resident of that county and that the county will pay for him if the people cannot pay for themselves. The hospitals do not get that money.

Dr. W. E. Gardner, Louisville, Ky.—Does a judge of any court approve that process?

Dr. Preston.—There is no judge in it anywhere.

Dr. Carrol C. Turner, Memphis, Tenn.—What prevents your two physicians from being sued by some shyster lawyer when that patient gets out?

Dr. Preston.—Nothing prevents the physician from being sued except the fact that nobody has won one of those suits in a very long time. If the physician follows the provisions of the law that he shall examine the patient separately, that he shall make out his certificate within seven days of the time he examined the patient, that that certificate shall be used within thirty days of the date of its signing, the law says that a person may be committed to an institution and held on such papers. All the doctor has to prove is that he did make an examination, that it was a competent examination, and that that was, in his opinion, the thing that needed to be done. The patient always has a right of appeal on habeas corpus.

Dr. J. G. Wilson.—How do you keep the private physicians who want to get rid of patients from loading your hospitals with non-mental cases? This is the trouble we have here, even in court procedure, putting in cases that are not mental cases at all.

Dr. Preston.—It is extremely difficult to substitute law for integrity. I do not know any method by which it can be done infallibly. I do say this much, that in Maryland we have been badly pushed as far as overcrowding is concerned, and that as a result of that and because of our peculiar situation it has been possible for the central office to have the hospitals telephone in to us every morning how many empty beds they had and to let the central office do the assigning of the beds by talking to the physician responsible for the case and finding out whether it is an urgent psychiatric problem or one that can be delayed for a while. We have managed to control admissions to a certain extent on that basis. We took it up as an emergency and it has been very effective. We get a number of patients who the superintendents say are not mental patients, and I think many of us psychiatrists would say they were not mental patients, but the community says they are terrible nuisances, and after all, you have to take them in hospitals, not on their psychiatric condition, but on their nuisance value.

Dr. Theodore A. Watters, New Orleans, La.—What relationship does your coroner bear to your commitment proceedings in Maryland, and how much power has he with regard to such procedure?

Dr. Preston.—Nothing; the coroner has something to do with dead people. We have no coroners any more, by the way; we have state medical examiners, and if somebody dies within the hospital in the first twenty-four hours we call the coroner in; if somebody suicides we call the coroner in, and if somebody is killed we call the coroner in. Persons are killed in state hospitals. By the way, I can serve as coroner by law in Maryland. I never have and I do not, but I can. I do not know why.

Dr. Watters.—I asked because that system still prevails in Louisiana.

Dr. Preston.—The coroner! Precociously dead if you are going to a state hospital, apparently. It seems difficult.

URETERAL STRICTURE*

ITS FREQUENCY AND DIAGNOSIS

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Ureteral stricture is one of the most important lesions of the abdominopelvic cavity. Failure on the part of the diagnostician to recognize this lesion has led to more futile therapeutics, medical and surgical, than has attended the nonrecognition of any other abdominal abnormality. Fortunately, the overlooking of a diagnosis of ureteral stricture is not often followed by such sudden disasters as characterize failure of early diagnosis in certain other abdominal and pelvic conditions. Too often death results from the inability to recognize, in their initial stages, an acute fulminating appendicitis or cholecystitis, a perforated gastric or duodenal ulcer, an acute intestinal obstruction, or a ruptured tubal pregnancy.

Neglected diagnosis of ureteral stricture does not often culminate in sudden death, but many lives are unnecessarily shortened because of the renal complications which develop as a consequence of stricture and poor drainage. If we add to these premature deaths the sum total of ill health caused by stricture, the morbidity due to the neglected renal complications and to the many operations on other organs, the economic loss in absence from work and in fruitless hospi-

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tal and medical bills, then we are compelled to accept this disease as one of our major problems in medicine.

The first argument of those who challenge these statements is that ureteral stricture is such a rare lesion that its occurrence can be practically ignored in the daily round of diagnostic work. The answer to this assumption is that many physicians in all parts of the world now number their stricture cases in the hundreds. In my own experience, covering 25 years of actually looking for stricture in those patients whose histories or physical examinations suggest the possible presence of this lesion, the diagnosis has been confirmed in approximately 3,500 cases.

A second stock argument is one not advanced by the general practitioner, but by the urologist, who has been unexplainably loath to grasp the important significance of good renal drainage. He maintains that a gynecologist, dealing exclusively with women, may find a greater prevalence of stricture than was formerly suspected, but that its incidence in the male patient is rare. This claim was refuted in 1925 by Nathaniel P. Rathbun,[1] of Brooklyn Hospital, on the basis of his clinic records for 1924. The 739 urologic patients listed were about equally divided as to sex, and every one of these was carefully examined for the presence of stricture. Results showed that this lesion was found in 92 cases, 48 times in men and 44 times in women.

A third contention, advanced by the general practitioner, is that this abnormality belongs in a highly specialized field of medicine, that its diagnosis demands a technic in which he has no training, and that therefore he cannot be held responsible for its recognition. Those sharing this view are reminded that every physician worthy of his profession should keep an accurate and painstaking history of his patients' complaints, should have the ability to make the ordinary manual physical examination of abdomen and pelvis, should own a microscope, and know how to carry out the routine microscopic examination and chemical analysis of the urine. These basic requirements cover the equipment and technic necessary for a highly probable diagnosis of ureteral stricture in the large majority of its victims. Indeed the physician should make a more accurate diagnosis in most cases of stricture than obtains in cases of chronic appendicitis, cholecystitis, or pelvic inflammation, and most physicians would feel insulted if accused of inability to arrive at a fairly accurate diagnosis in these cases.

Of course the general practitioner and his patient both deserve sympathy if the physician, on the basis of a probable diagnosis of ureteral stricture, sends his patient to a urologist who still ignores the importance of this lesion. This urologist passes a catheter without bulb, and finds no evidence of obstruction, inasmuch as even large catheters (7, 8 and 9 caliber) encounter no appreciable resistance in two-thirds of stricture cases. The urologist then misreads the urograms, unless they happen to reveal gross changes, and assures the family physician and his patient that the symptoms do not arise in the urinary tract. Then follows another quest for diagnosis, too often attended by one or more futile abdominal or pelvic operations. Should the urologist's examination reveal a prolapsed kidney, with convolutions in the redundant upper ureter, the patient will, in all probability, be subjected to a nephropexy. If this is not accompanied by adequate dilatation of the stricture area, the end result is as disappointing as in the case pronounced free of urinary tract disease, and the patient returns to the general practitioner with no alleviation of the original symptoms.

In order to avoid such pitfalls, one course of action is clearly indicated on the part of the general practitioner who believes he can make a tentative diagnosis of stricture. He must learn which men in his vicinity are doing conservative stricture work, be they specialists in urology or abdominal or pelvic surgeons who carry out their own urologic investigations and treatments.

If he refers his suspected urologic patients to some distant medical center he must make the same inquiries, for there still exist some urologists of national reputation who pay practically no attention to ureteral stricture. We have advanced to the stage of progress where all urologists now talk of the advantages of good upper tract drainage, but many of them do nothing else about it. This attitude is well illustrated in a recent publication by Randall,[2] who, after lauding the great advantages of the diagnostic means of intravenous urograms, says: "Think of this concept and what it means by realizing what has become of the frequency of that passing fad, the ureteral stricture—'gone with the wind' that blew it into our clinics, because now we visualize undisturbed urine transportation."

Unfortunately for the patient, there still are more than a few of the Old Guard in urology who, although they taught us the necessity of using a bulb for the thorough study of urethral stricture, refuse to acknowledge its equally efficient function in examination of the ureter. Most of those urologists who employ intravenous urography would probably agree that, to date, it has been of more harm than help in diagnosis. The procedure is of the greatest value in certain selected cases, but it has been used by general practitioners, internists and others who are not thoroughly familiar with the interpretation of urologic films, and who do not realize how indispensable, for study of the finer details of abnormalities of the upper tract, are films obtained by the retrograde method. The result of this confusion is that many films taken by the intravenous method are read as normal, and many patients who have a serious urological lesion as the basis of ill health are turned over to some other domain of diagnostic medicine without a thorough urological examination.

Methods of Diagnosis.—The general practitioner who has not devoted thought to the subject of ureteral stricture is now asking how he should go about the diagnosis of this malady. As already stated, diagnosis depends upon the salient points presented by (1) the case history, (2) the ordinary physical examination, and (3) the urinalysis. One hesitates about listing the multifarious and sometimes bizarre symptoms which may attend the presence of ureteral stricture for fear of being accused of plagiarism from patent medicine advertisements. However, a rare patient may present such an indefinite history that the diagnostician of vast experience with stricture may not even suspect this lesion until he makes the physical examination.

In examining the abdomen and pelvis one finds tenderness along the upper urinary tract. In women the left kidney may not be palpable, but in stricture cases one often elicits tenderness on deep palpation of this region, and the patient may volunteer the comment that this reminds her of the "misery" she has had in the back. The right kidney is palpable in the majority of women and, if ureteral stricture is present, the kidney is usually but not always tender.

The second area to be carefully palpated is that located over the ureter where it crosses the pelvic brim. Having identified the promontory of the sacrum, one follows this laterally, the fingers bringing pressure over the ureters as they cross the pelvic brim in the bony depression beside the sacral promontory. If this is the only sensitive point found along the upper urinary tract, one should consider the probability of its being due to inflammation of the sacro-iliac joint or of the iliac glands.

Literally thousands of normal appendices have been removed because of tenderness at the pelvic brim crossing of the ureter, or at Morris' point. One can generally differentiate between ureteral and appendical tenderness by bearing in mind that Morris' point is found by first locating the sacral promontory, and then moving laterally with the fingers, while McBurney's point is found by first locating the anterior superior spine of the iliac bone, and then moving toward the navel. As a rule, one can determine fairly accurately whether the tenderness found in the right lower quadrant arises from the appendix or the ureter. Each of these diseases is of such common occurrence that not infrequently the patient shows signs of both conditions, which are usually verified by operation on the appendix and by ureteral investigation and treatment.

If the patient be a victim of stricture, the tenderness elicited by pressure at the pelvic brim frequently prompts the voluntary state-

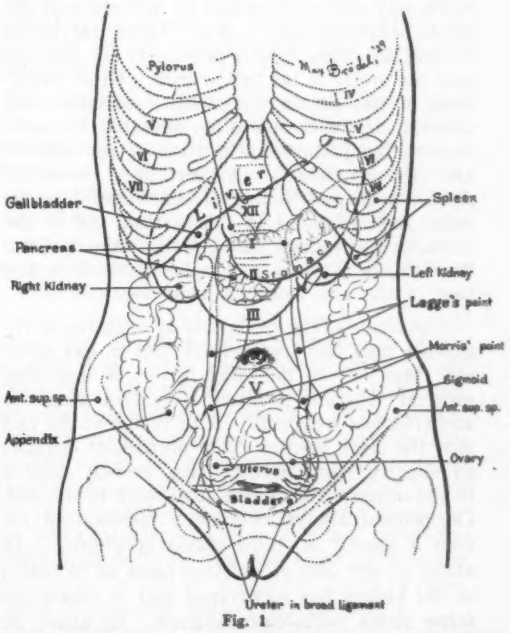

Fig. 1

Schematic illustration of the close relationship of some portion of the urinary tract to each of the other organs of the abdomen and pelvis.

ment that this discomfort imitates the abdominal soreness already described in the history as intermittently present in the region of the navel, and increased by the constriction of tight bands or clothing. Another patient may say that it reproduces frequently experienced gas pains or the pains of indigestion. If the patient has been subject to eructation, this pressure at the pelvic brim may initiate eructation during the examination, and referred pain is often complained of in the epigastrium, in the corresponding kidney, or directly through to the sacro-iliac region.

The third point of tenderness, and the most constant one, is found in the juxtavesical portion of the ureter, as this is the most common location of stricture. If the examiner is not ureteral-stricture-conscious, the tenderness in this region is too frequently mistaken for a sign of pelvic inflammatory disease in women, or for prostatic or seminal vesicle disease in men.

If ureteral stricture be present in the broad ligament region, one can occasionally palpate the thickened, infiltrated area, and cannot always determine whether the stricture area contains a stone. Palpation of this area often elicits some of the patient's former symptoms. If these have included bladder distress, this is practically always produced by palpation of the ureter-broad-ligament region. Often the desire to void has been caused previously by pressure over the ureter at the pelvic brim. Other symptoms in this region, commonly associated with ureteral stricture, and often imitated by pressure on the juxtavesical portion of the ureters, are dysmenorrhea, dyspareunia, "ovarian" pain, descensus ("falling of the womb") sensations, referred pains in the urethra, out in the labia, in the vaginal vault, rectal pain or simulated desire to stool, and pains referred to any part of the hip, thigh or lower leg.

Urinalysis.—The urinalysis as a means of diagnosis may be most helpful, but it has probably been one of the chief factors in depriving ureteral stricture patients of correct diagnosis and effectual treatment. This is due to the fact that the urine is often quite normal, or deviates so slightly from normal, that serious trouble in the urinary tract seems justifiably eliminated. One should always examine a catheterized (in men a second or third glass) specimen. In about 20 per cent of stricture cases an infection of the kidney has supervened and of course the urine yields pathologic evidence. In about 50 per cent of stricture cases one may find only an occasional leukocyte, or erythrocyte, or a trace of albumin, or a few casts. Formerly such findings were ignored as being "so slight as to have no significance." Finally, in about 30 per cent of stricture cases the urine is normal. This leaves such a wide margin for error in diagnosis that it is best not to depend on the urinalysis, should the history and physical examination suggest stricture. Of course a thorough urinalysis, including cultures (if the media are available), should be made in every suspected case. The presence of pathologic elements in the urine establishes one of the best standards for measuring the effect of subsequent treatment.

If the physician has never diagnosed a case as one of ureteral stricture, and is uncertain about ever having seen a patient with symptoms due to stricture, I would advise him to review the patients now under his care for whom he has arrived at the diagnosis of neurasthenia. Particularly would I advise careful study of those patients who are carrying scars of one to sixteen operations, and who still complain of their original symptoms.

In the early days of ureteral stricture work, from about 1915 to 1920, the insistance that abdominal surgeons and gynecologists were doing too much operating was resented by some of my colleagues. However, the restoration to a fair degree of health in many of the multiscarred victims of those operations, by means of the comparatively simple procedure involved in reestablishing good renal drainage, made it seem a duty to continue spreading this unpopular heresy. Many of these patients had my own trademark along with the scars left by other men whom I knew to be skilful and conservative surgeons, so I could appreciate what it meant to the general practitioner to have these patients repeatedly thrown back on his care, still complaining of their former symptoms after immediate convalescence from operation.

My earliest followers in this work were composed largely of general surgeons and gynecologists who made their own urologic examinations and were glad to test any method which promised to reduce the percentage of their unsuccessful operations. Letters from such investigators invariably expressed incredulity over the high incidence of ureteral stricture when looked for, but ended with the observation "as long as patients continue to get well we are obliged to believe in this diagnosis and treatment."

Further Details of Symptomology.—Many

of the symptoms have been previously mentioned in outlining the method of physical examination, but, before closing this discussion, we should attempt to draw a more systematic picture of the complaints which experience has shown to be suggestive of ureteral stricture, with its accompanying renal stasis.

Headache or backache, for which former treatment has been of no avail, should suggest stricture. If chronic and persistent gastro-intestinal symptoms are present, and if the same patient says, "I have pains in my side," one is more suspicious of stricture; and if, on questioning, these symptoms are found to be accompanied by spells of frequent voiding, one has before him a patient with five of the chief disturbances caused by ureteral stricture.

Of course these five complaints, either singly or in any combination, arise from so many morbid conditions that the diagnostician is prone to pay but little attention to them. However, he is a poor diagnostician who has failed to learn that no item is too trivial or vague to be included in a well-rounded history; and who, when confronted with a patient giving a more or less weird list of complaints, fails to synthesize these symptoms and to seek a cause that may account for them. In the past we have made too much use of the diagnosis "neurasthenia" and its cousin, "psychoneurosis."

Certain cases, in which headache may or may not appear, present dizziness, clouding of vision, mental sluggishness, nervousness and irritability without apparent cause, asthenia and lack of mental and physical initiative. Such symptoms are not rare in an adult who, until comparatively recently, has boasted good health and vitality. The mental depression may be accompanied by delusions and hallucinations and even the threat of suicide. In seeking to relate such symptoms to the kidney, one must assume a toxemia resulting from failure of that organ properly to dispose of its excretory products.

Gastro-intestinal disturbances sometimes occur independently of the head and nervous complaints, but more often they are present in the same patient and probably can be explained on a similar basis. Every surgeon is familiar with the gastro-intestinal crises which sometimes supervene when a calculus suddenly blocks the ureter, and not a few patients have suffered operation for acute intestinal obstruction who should have been relieved by freeing the urinary tract of obstruction. When the obstruction has developed slowly, as is usually the case in the presence of ureteral stricture, we find unexplained loss of appetite, coated tongue, bad breath, gaseous distention, eructation, nausea and sometimes vomiting, diarrhea, rectal pressure and mucous colitis. These symptoms, singly or in any combination, can probably be traced to the close association of the renal and ureteral sympathetics with those of the digestive tract. Disturbances of the normal processes of digestion serve to add further toxins to those of the obstructed kidney, resulting in the manifestations noted.

When one has been able to relieve many of these patients, including some subject to severe migraine, with accompanying gastro-intestinal disturbances, and many victims of chronic colitis, by means of the one simple expedient of restoration of good renal drainage, he feels more than justified in urging the general practitioner to familiarize himself with the diagnostic symptoms and signs of ureteral stricture.

It is of great value to remember that the pain of an overdistended kidney, instead of being local, or referred down the line of the ureter, or posteriorly into the sacral or iliac regions, may be referred exclusively to the region of the thorax. If it is on the right side, it is often mistaken for disease of the gallbladder; if located in the left thorax, the patient often complains of "pain in the heart."

I have had several patients who have spent one or more terms at some distant resort for tuberculosis, because of a constant dull pain in the thorax and a slight daily rise of temperature, in whom no positive evidence of pulmonary disease could be found. To see these chest pains and the fever (if present) promptly disappear upon restoration of adequate renal drainage is a most satisfactory experience.

The onlooker who still remains skeptical about the usefulness of this knowledge to the general practitioner may profitably study the opinions of Beck,[3] an internist of Baltimore, who has made a careful estimate of its application to general practice. The conscientious doubter might also consult "End Results in One Hundred Cases of Ureteral Stricture,"[4] in which the present author has elaborated on the number and character of gastro-intestinal symptoms found in association with this lesion, and on the percentages of these symptoms cured or alleviated through the method advocated.

The limitations of this paper do not permit discussion of the many ways in which the sus-

pected gynecologic patient is benefited if the general practitioner bears in mind the high incidence of ureteral stricture, and knows how to differentiate pelvic symptoms belonging to the genital from those belonging to the urinary tract. I have commented at some length on these features in a previous publication, "What the Gynecologist Should Know About Urology."[5]

Those especially interested in unexplained bladder symptoms will find many of these accounted for in "Intractable Bladder Symptoms Due to Ureteritis"[6] and in a more recent publication, "Neurosis of the Bladder."[7]

"Drainage as a Factor in Renal Disease"[8] is an attempt to picture the role of ureteral stricture as one of the chief causative factors in most renal diseases belonging in the surgical field. The last section of the paper contains this statement:

"Just what part defective drainage may have in the renal diseases usually considered as purely medical offers a fertile field for future research."

During the last few years an increasing amount of attention has been paid to the attempt to solve the many problems first systematically proposed by Richard Bright in 1827. The most hopeful feature of this renewed interest is the growing conviction that Bright's disease does not belong exclusively in the domain of the medical man and the pathologist. The experimental physiologist and biologist, the surgeon and the urologist are now actively participating in the study and treatment of this malady. In numerous publications I have urged the general practitioner to be on the alert for symptoms and signs of ureteral stricture in dealing with cases diagnosed as Bright's disease. Particular care should be exercised with the children and young people in this group, as early diagnosis and treatment may restore the kidneys to approximate health.

The symptoms herein outlined as characteristic of ureteral stricture, with its impaired renal drainage, are the same symptoms as those met with in many cases of incipient Bright's disease. Recognition of this fact has restored many of my patients to active and useful lives, who otherwise seemed destined to go on with increasing signs of chronic Bright's disease. In another group are a few patients, some of them still leading useful lives after periods of from five to twenty years, who first consulted me with one or more of the signs of advanced Bright's disease, such as uremia, coma, convulsions, hypertension, extremely low renal function, marked albuminuria, or marked hematuria with severe grade anemia and threatened heart failure. Their subsequent histories substantiate the claim for ureteral dilatation with restoration of renal drainage as prompt life-saving measures in some cases of Bright's disease.

CONCLUSIONS

In most cases of illness the general practitioner is the first and most important line of defense. If the patient complains of head, back, abdominal or pelvic distress without accountable lesions, and particularly if these symptoms persist despite previous diagnoses and ineffectual treatments, the urinary tract should be carefully investigated.

Ureteral stricture is one of the most frequent lesions of the abdominopelvic cavity and has probably been responsible for more errors in diagnosis than has any other abdominal lesion.

The general practitioner should be able to make a fairly accurate diagnosis of this lesion in the vast majority of cases. By making early diagnosis and insisting on adequate treatment, he is practicing scientific medicine, which rates the prevention of disease on a far higher plane than its cure.

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TEACHING INDUSTRIAL HEALTH TO MEDICAL STUDENTS*

By FRED J. WAMPLER, M.D., M.P.H.
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During the last several years there has been a great increase in interest in the health and physical fitness of the industrial worker. This is true for industrial management and is also true for the medical profession. Just a few years

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ago the National Association of Manufacturers appointed a Committee on Healthful Working Conditions. At just about the same time the American Medical Association set up a Council on Industrial Health. These two new groups in the field have been very active. They now supplement the work the Government had been doing over a number of years, which also has been greatly augmented during the last decade.

With our preparedness program getting into full swing, interest in industrial health is still more intensified. Dr. Victor G. Heiser,[1] consultant for the Committee on Healthful Working Conditions of the National Association of Manufacturers, speaking at Muskegon, Michigan, recently said:

"The apparent inexhaustibility of the German war machine is due particularly to the carefully planned industrial health program of the Nazi regime."

After pointing out that the smashing power of the hated German war machine was possible only through physical fitness in the industries supplying material and equipment, Dr. Heiser decried the fact that the regimented health program of Nazi Germany was in reality a fattening of the calf for slaughter. What I do want to stress, he said, is that we can with voluntary cooperation of labor, management, medicine, Government and the public accomplish an even greater degree of physical fitness and efficiency in our industrial defense without regimentation.

Also on the subject of "National Preparedness," Dr. Fishbein,[2] in an editorial in the July 6 *Journal of the American Medical Association,* says:

"The skilled worker becomes of importance equal to that of the man under arms; his indispensability grows as it becomes difficult or impossible to replace him," and, "important is the task of guarding the existing supply of competent and skilled workers against preventable disability."

There are approximately fifty million people 10 years old and above engaged in work for pay in the industrial, professional, transportational and agricultural fields. This is nearly 50 per cent of the entire population in this age group. There are more than fourteen millions of workers in manufacturing and mechanical industries. More than 60 per cent of this fourteen million are working in plants employing less than five hundred employees.

Somewhere between fourteen and fifteen hundred physicians in the United States give full time or a major part of their time to industrial medicine.[3] It is estimated that 85 per cent of the general practitioners have some industrial practice. Most of the medical work for the smaller industries (employing less than five hundred) is done by these general practitioners. To prepare these physicians for this type of service the medical schools have done very little.

The basic objectives of industrial practice are:

(1) Regular appraisal of plant sanitation;

(2) To ascertain by examination the fitness of individuals for industrial work and to place individuals in positions consistent with their physical and mental assets and liabilities;

(3) To maintain and improve the health and efficiency of those already employed;

(4) To treat promptly any early illnesses resulting from occupational exposure;

(5) To refer to the family physician individuals with conditions needing attention, and cooperate with the family physician in every way possible;

(6) To educate the worker on matters pertaining to personal hygiene, reducing lost time and absenteeism from occupation because of illness or injury;

(7) Provision of rehabilitation services within industry.

According to a survey made by the Council on Industrial Health of the American Medical Association,[4] fifty-two medical schools were able to report quantitatively the time assigned to required instruction in industrial hygiene. This teaching is generally done in the department of preventive medicine. The average time allotted to industrial hygiene in the fifty-two schools is slightly in excess of five hours. More than half of these schools fall below the five-hour allotment. Field trips averaged only one for the entire fifty-two schools, twenty-four of the schools reporting no field trips at all.

In the survey above referred to twelve medical schools reported elective work in industrial hygiene. Some of these were electives available in graduate industrial hygiene courses, while others were especially set up for teaching the medical students.

Fractures in industry are not unlike fractures under other conditions. Lacerated wounds produced in industry are treated like similar lacerated wounds produced in automobile and other non-industrial accidents. Burns produced in industry are treated like burns produced outside of industry. Since these subjects are well taught in medical schools at the present time, what in-

dustrial health needs to teach is the way to look for the early signs and how to prevent industrial diseases as well as accidents. Even when toxicological hazards are at the lowest possible minimum, and it is still dangerous to health, little signs should be learned which will enable the industrial physician to remove a man from that hazard until his body has had the opportunity to correct this early pathologic development. This can often be done by transferring a man to a different zone of work where this particular hazard does not exist.

The objectives of teaching industrial health to medical students in the writer's opinion are:

(1) to help the medical student to understand what good industrial practice is:
   (a) so that he will not be lost if he is one of the 85 per cent taking on some industrial practice;
   (b) that he may know state compensation laws;
   (c) that he may cooperate fully with the full-time industrial physician;
   (d) to teach the possibilities in adult health.
(2) to inspire some to take up industrial medicine as a life work.

To practice industrial health the physician must have the help of the industrial engineer, the chemist and the nurse. The industrial physician must know what potential hazards exist in his plant as well as how to treat patients. He should be consulted even before the factory is built. He should know the chemicals used in manufacturing in the plant, even know what substances these chemicals are made of.

It is very necessary for the medical student to know about compensation laws. He should know this whether he is going into industrial practice or if he is in general practice. He should be taught what are good and what are bad compensation laws. He should also know what diseases in industry he should report to the Governmental authorities.

Industrial physicians in the past have often found the private practitioner on the outside opposed to the work they are trying to do and even working against them. Since the average medical student is taught the purposes and the practice of industrial health as it is being done in the better plants today, this friction should be reduced to a minimum, if not entirely eliminated.

The industrial physician can be of considerable help to both the private practitioner and his patient. The former has considerable information, through x-rays and repeated physical examinations, that might be of much value in diagnosing the patient's condition.

To teach industrial health there is a minimum of lecture work involved. Much of this may be given by the departments in which these subjects would naturally fall in the medical school. For example, the toxicology of certain chemicals could be handled either by pharmacology or chemistry. Physiology could aid in the teaching of ventilating technic and fatigue phenomena. Pathology could aid in showing the end results of silicosis and other gross pathologic conditions following over-exposure. With these things as a basis the rest of the teaching should be clinical. Efforts should be made to contact the more important industries in the neighborhood and to have the students visit the medical and health set-up of the plants and there at first hand see just how the medical work is carried on. Efforts should be made to get the students into the smaller plants where hazards are large and where there is little or no medical or health supervision, as well as into the plants that are run in the most modern manner.

In the Medical College of Virginia, industrial health is begun in the sophomore year and carried on into the junior and senior years. The sanitary and environmental aspects are emphasized in the sophomore year and the majority of the field work, seven trips, is done at that time. The toxicologic, sociologic and legal aspects are taught by lectures in the junior year. In the senior year field trips are made to a plant with modern medical and health set-up and to the State Health Department's Bureau of Industrial Hygiene. Here they see what the engineer and the chemist can do toward finding health hazards in industry. Here the different types of instruments for making plant surveys are seen and actual working technic is demonstrated.

In the Medical College of Virginia the course in the senior year is so arranged that the student must select as an elective some subject that he feels he is deficient in or some subject in which he is especially interested. This must be something in which he spends the entire four weeks. We have arranged with one of our industrial plants to take these students into their set-up where they will work under the direction of the medical department during the working hours and have required readings that they do in the evenings. Five members of our senior class who graduated in 1940 took industrial health as their

elective and spent the month as described. They were all enthusiastic about what they had learned about good medical practice in industry as well as things they learned that reached into other departments, such as dermatology and roentgenology.

Tabulating the above two paragraphs, we have:

INDUSTRIAL HEALTH TEACHING IN THE MEDICAL COLLEGE OF VIRGINIA

Year	Lectures	Field Trips
Sophomore	5	7
Junior	9	0
Senior	0	2
Total	14	9

Senior elective, one month, full time, in the medical department of an industrial plant.

Many of the leading men in the field of medicine have visioned the practice of preventive medicine as the ideal medicine of the future. So far we have had little success in developing a working plan or in getting any number of practitioners to undertake such a practice.

General medicine has not worked out a set of standards for the adult as the obstetricians have done for pregnant women and the pediatricians for the child.

Since industry has a large number of adults working in groups, many men similarly exposed to toxic conditions of various degrees of vapors, fumes, dusts, humidity, heat, fatigue, et cetera, its medical men have the opportunity to compare the wear and tear on groups of these people with the average individual in and out of industry. By studying the changes in blood pressure in one group compared with another, by studying the blood picture in one group compared with another, by studying the urinary findings in one group compared with another, and by many other comparisons, we have an opportunity to find how different kinds of toxicologic exposures begin to show their effects upon the human machine.

The death rate among industrial workers having medical care declines more rapidly than that of the general population. But preventive medicine should not only prolong life, but should make life more joyous and more abundant. Industrial health is in reality adult health and modern industrial medicine should be able to work out a new set of standards by which we can measure the deviations from optimum health for the average adult. It is the duty of medical schools to train men to think in these terms.

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Southern Medical Journal

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M. Y. DABNEY, M.D., Editor
C. P. LORANZ, Secretary, Treasurer and General Manager

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EDITORIAL DEPARTMENT

SOUTHERN MEDICAL ASSOCIATION
Thirty-Fifth Annual Meeting
St. Louis, Missouri, November 10-13, 1941

ST. LOUIS MEETING

CHANGE IN DAYS OF MEETING

The Southern Medical Association meeting will be held in St. Louis on Monday afternoon, Tuesday, Wednesday and Thursday, November 10-11-12-13 instead of Tuesday, Wednesday, Thursday and Friday forenoon, November 11-12-13-14, as was previously announced.

The Association will open at noon on Monday, the registration beginning at that time, the scientific programs starting at 2:00 p. m. and continuing through Tuesday, Wednesday and Thursday. All Association activities will be concluded in the late afternoon of Thursday. The registration, scientific and technical exhibits, all clinical sessions, all sections and all conjoint meetings, will be held at the Municipal Auditorium.

The general session, open to the public, will be held on Monday evening; the general session for the address of welcome, the President's address, the report of Council, and election of officers, followed by the President's reception and ball, will take place on Tuesday evening; and the alumni reunion dinners will be held on Wednesday evening. All these activities are to be held at the Jefferson Hotel.

Clinical sessions, presentations exclusively by St. Louis physicians, offer an unusually attractive curtain raiser for the meeting. They will be held Monday afternoon and Tuesday forenoon. The general clinical session, the program for which has been arranged by the President, Dr. Paul H. Ringer, Asheville, North Carolina, will be held Tuesday afternoon. Dr. Ringer will preside over it. Several of the smaller section groups will hold their meetings on Tuesday concurrently with the clinical sessions, but in the main the section meetings will be held Wednesday and Thursday.

MINIATURE MASS RADIOGRAPHY

The prodigious armies of 1941 require the latest industrial development and modern invention in destructive weapons and in transportation. They also require the application of medical and public health measures on a scale never dreamed of before. If streamlining means speed and mass production, health measures must become streamlined to be applied to the millions of men who are now temporarily crowded together.

To prevent tuberculosis in the army, Germany, Holland and certain South American nations some years before the present war broke out, were developing rapid economical methods of radiographing chests of soldiers.[1]

The English more recently have attempted the introduction of small films and rapid fire machinery for taking x-ray pictures. Sparks,[1] of Brompton, in a June number of the *British Medical Journal,* discusses some of the problems of the process. It would be desirable, he says to examine all registrants as they come up to enter the army; and more recently as young women have registered for essential work, the value of roentgenograms of these too has been stressed.

For taking roentgenograms of these tremendous numbers of chests, there are necessary an x-ray machine capable of taking two hundred pictures per hour or up to fifteen hundred daily, an electrical device to bring the new film quickly into place, a method of photographing the pa-

1. Sparks, J. V.: Some Problems of Miniature Mass Radiography. British Med. Jour. No. 4198, June 21, 1941.

tient's name on the film, and other modifications of the usual apparatus. The Royal Navy with its equipment has taken as many as 220 pictures per hour. The time of exposure (0.3 seconds) is very much longer than that used in routine radiography. The pictures obtained and magnified for examination are not so clear as the usual large roentgenogram, but have been proven very definite and practical for excluding the majority of cases of tuberculosis. The methods being worked out, Sparks thinks, will be much used industrially after the war.

Medical diagnostic technics used for examination of civilians at the present time are slow, cumbersome and expensive. As they are employed in private practice they could not be applied to an army. Roentgenograms, blood chemical analyses, electrocardiograms, gallbladder, kidney, or stool examinations, are certainly not now organized for use on a general population. As regards economy of time, the medical profession in a way is still employing the ox cart instead of the airplane. It has progressed marvelously in knowledge of means of learning the cause of symptoms of a single individual. There has not been an economic incentive to mass production of these services, to distribute them so widely as probably even the low priced automobile.

Military organization and industrial mobilization of millions of men always speed the distribution of medical services to many persons who heretofore have never had them to an adequate extent.

The method of use of the miniature chest roentgenograms may greatly extend the scope of all x-ray work, and make it much more generally available.

PINEAL BODY

There has been a large school of thought which believed that the pineal body of mammals is a remnant of the reptilian midline eye. Understanding of its function, if it has one, is in confusion, and whether it is a gland of internal secretion is still regarded as unsettled. Dictionary definitions call it non-committally a "body," not a gland.

Martin and Davis,[1] of Northwestern University Medical School, have investigated its function by ablating it in several species of animals, most extensively in cats; and have produced what they consider to be a definite syndrome, and compared this with the histories of human cases of pineal tumor from the Cushing Tumor Registry.

Pinealectomized cats, according to the Chicago workers, show certain characteristic physiologic changes. If the gland is removed carefully from young animals, the females become sexually mature later, and the males earlier, than do normals. The male animals grow large earlier than the controls. Pinealectomized cats, both male and female, produce small litters, and the females are indifferent to their kittens which are delicate, difficult to rear, and prone to infection. Among second generation kittens, the mortality is very high.

When these observations were compared with clinical case histories of pineal tumors which have come to autopsy, a considerable parallelism was noted. There was some precocity of development both muscularly and sexually in young boys with pineal tumor. Among young girls, puberty was delayed. Adult males in whom tumors presumably developed after maturity, though married were sterile.

These data would seem to assign the pineal body a distinct function in control of at least the rate of development, in males particularly, and also in reproduction. There were clear cut variations from the normal physiologic course after its extirpation.

Endocrines in general govern function by controlling the supply of nutrient elements to the tissues. Each gland is capable of rapidly altering the concentration in the blood of one or many elements. Activity of a given hormone is, for the most part, particularly associated in physiologic studies with a single food element. The thyroid gland particularly controls iodine metabolism; it likewise affects the utilization of calcium and other minerals, though this effect has received much less consideration. The parathyroid secretion quickly raises blood calcium, and also produces profound variations in the phosphorus level. The islets of Langerhans control the level of blood sugar, and the blood calcium and phosphorus concentrations likewise are changed by insulin injection. The hormone of the adrenal cortex

1. Martin, John; and Davis, Loyal: Syndrome of Destruction of the Pineal Gland: Experimental and Clinical Observations. Arch. Int. Med., 67:1119 (June) 1941.

raises the blood sodium level and has an effect also upon potassium and sugar; and so on. The endocrines control the supply of these materials in the blood, by releasing them rapidly from a storage depot or promoting their utilization and deposit.

The above mentioned glands are so important in body economy that great distress or death may quickly follow their operative removal. The pineal effect is obviously much more slowly acting. Pinealectomized animals survived and some second generation young were obtained. When a blood chemical change characteristic of pinealectomy is demonstrated, more rapid progress may be made. The anterior pituitary likewise may be removed without immediate critical symptoms; but the pituitary is a very vital organ, and the source of a group of essential hormones and body regulators.

TWENTY-FIVE YEARS AGO

From Journals of 1916

Typhoid in Birmingham.[1]—In Birmingham, beginning the latter part of June, there occurred an explosive outbreak of typhoid fever; and in thirty days nearly 500 cases were reported. While not a large number of cases for a city of 175,000 population, the health authorities proposed to stop the epidemic and permanently to eradicate the disease from Birmingham and Jefferson County. A request was made to the United States Public Health Service to detail its chief typhoid expert, Dr. L. L. Lumsden, who is regarded as the greatest typhoid epidemiologist in the world, to come to Birmingham to study conditions and to make recommendations for permanently freeing the city and county from this disgrace.

The cause of the outbreak in Birmingham was traced to ice cream from a large factory, a part of whose milk supply was obtained from an infected dairy.

Typhoid in Florida.[2]—From the reports of the Census Bureau collected by the State Health Officer, it appears that the death rate of the State from typhoid fever is very high, being twice that of the average of the Registration Bureau, but the death rate from diphtheria is low.

Flies.[3]—At Miami, the boys and girls of the city are competing for a prize in a fly swatting contest. The prizes offered are $10.00, $7.50 and $5.00 for those presenting the greatest number of dead flies.

Birth Registration.[4]—At Jacksonville, as an evidence of how rigidly the health authorities are enforcing the law requiring the registration of all births and deaths, several of the most prominent physicians were fined for failure to comply with this regulation.

Hope They Choke.[5]—A Sewanee professor's children were in the nursery where the little girl had with much difficulty persuaded her older brother, aged 10, to play dolls with her.

"Go 'phone for the Doctor," directed Mary.

John walked over to an imaginary 'phone and began: "Is that you Doctor? Well the dolls are sick, but I just wanted to say that you needn't come. I want 'em to die."

1. Editor's Note, Report on Typhoid Fever in Birmingham, with Recommendations for Its Eradication, by L. L. Lumsden. Sou. Med. Jour., 9:711 (August) 1916.

2 and 3. Southern Medical News. Sou. Med. Jour., 9:667, 1916.

4. Ibid, p. 761.

5. Placeboes. Sou. Med. Jour., 9:30 (August, advertising section), 1916.

Book Reviews

Elimination Diets and the Patient's Allergies. By Albert H. Rowe, M.D., Lecturer in Medicine, University of California Medical School, San Francisco, California. 264 pages. Philadelphia: Lea & Febiger, 1941. Cloth $3.00.

This book is an abbreviated treatise on allergy in general with special reference to the part played by foods and also with special emphasis on the author's trial diets both in diagnosis and treatment of allergy.

All through the book the fallibility of skin tests is stressed. Nevertheless skin tests still are the quickest and surest guide to the cause and treatment of allergy. Dr. Rowe's trial diets are a valuable adjunct to skin tests in diagnosis and treatment.

In this volume his diets are revised and the caloric and mineral value are carefully estimated. This book is valuable for any physician who is attempting to treat allergy without benefit of skin tests and is of especial help as an adjunct to them. It is well written, carefully edited and indexed and is well worth the time of anyone interested in the subject.

Play for Convalescent Children in Hospitals and at Home. By Anne Marie Smits, Staff Instructor, Leaders' Training School, Community Recreation Service, Chicago, Illinois. 133 pages. New York: A. S. Barnes and Company, 1941. Cloth $1.60.

This is a timely little book emphasizing the importance of play in safeguarding the child's emotions against the fears of approaching surgical treatment or the pangs of loneliness and homesickness in hospitals. The choice of games for particular situations, the training of special workers as well as the ward nurses are well covered and the bibliography is extensive. The importance of giving due consideration to this phase of the child's inner life is shown to be beneficial not only to the child but to

those entrusted with his care in making him more amenable to treatments. The value of this form of mental therapy is apparent and it is gratifying that it is becoming a systematized procedure.

Brucellosis (Undulant Fever) *Clinical and Subclinical.* By Harold J. Harris, M.D., Health Officer, Westport, New York; Consulting Physician, St. Lawrence State Hospital. 286 pages, illustrated. New York: Paul B. Hoeber, Inc. Cloth $5.50.

The author's quotation that there are twelve million cases of brucellosis in the United States is a challenge to the medical profession. This estimate coincides with that of all who have made a thorough study of this subject. The interesting if somewhat spectacular review of this book in Time Magazine suggests that patients will soon demand that physicians rule out brucellosis before labeling them psychoneurotics. Harris points out that the paucity of bacteriologic proof does not constitute valid denial of its existence since, on indirect evidence, diagnoses of syphilis, tuberculosis, and other diseases with protein manifestations are accepted. Poston, Evans and others have demonstrated the organism in a number of chronic cases.

For proof of etiology, the author often relies upon the therapeutic test with vaccine. His results with vaccine are so much better than any others reported that the accuracy of this method is open to question. There is also a tendency to blame brucellosis for all symptoms exhibited by the patient at the time of study.

Harris agrees with others that the agglutination test, excluding culture, is the most accurate aid, but it is frequently negative in the face of positive culture. He believes it to be an index of the patient's resistance, whereas most authorities believe that it measures the activity. It is often negative irrespective of either.

The skin test is negative in 39 per cent of patients with positive cultures or agglutinations. It varies from time to time in the same individual. The author compares it to the tuberculin test in significance. Diluted vaccine is as satisfactory as brucellergin, and is much cheaper. The opsonocytophagic index is the least reliable test, and those supposedly with immune reactions may have active infection. The author's modification of Huddleson's technic is good.

An admitted weakness is the lack of cultural evidence, but this does not excuse the failure to give details of cultural methods for all types of lesions.

The medicolegal section regarding dairies which dispense infected milk is interesting.

A very complete discussion of the various skin lesions with good illustrations is presented, but proof that they are all due to brucellosis is not convincing.

"Brucellosis, like tuberculosis, is a disease in which the balance between infection and immunity determines the well-being of the patient. The organism may remain." In other words, brucellosis should be spoken of as "arrested," not "cured."

This monograph is the result of a careful study with long follow-ups of a large number of patients. It will not convince the skeptics because of the lack of cultural evidence, but if it serves merely to cause the average physician to keep brucellosis in mind as the cause of many lesions, both common and bizarre, so that they may investigate their patients more thoroughly, it will have accomplished a great deal.

Spermatozoa and Sterility. By Abner I. Weisman, M.D., Adjunct Gynecologist, Jewish Memorial Hospital, New York. 314 pages, illustrated. New York: Paul B. Hoeber, Inc., 1941. Cloth $5.50.

Only within recent years has much time, energy and effort been exerted in the study of male sterility. A few years ago women were subjected to major surgical procedures in an attempt to cure sterility without consideration of the male partner, although it was known that the complications of mumps and gonorrhea frequently sterilize the male.

Review of various recent works on urology fails to reveal one that contains much data upon spermatozoa and male sterility. For these reasons a text covering the diagnosis and treatment of sterility in the male with special emphasis upon the study of the semen and spermatozoa is welcomed.

Everything related to the subject from the earliest history to the most recent work on the examination of the semen and the treatment of deficient cases with the hormones is included, with the many fine details that are essential for accurate work and satisfactory results. The chapters dealing with collection, transportation, and examination of the semen are especially of great value. Not only is it important to know that the patient has spermatozoa, but the ejaculate must be studied for volume, the number of spermatozoa per c. c., the number of hours they survive, and the percentage of deformities before an opinion that is of value can be rendered. The answers to all these questions are covered in detail as well as the treatment indicated in individual cases.

This book fills a long-felt need in the field of sterility. It places the study of male sterility upon a sound scientific basis.

Sex Variants. A Study of Homosexual Patterns. By George W. Henry, M.D. With Sections Contributed by Specialists in Particular Fields. In Two Volumes. 1,179 pages, illustrated. New York: Paul B. Hoeber, Inc., 1941. Cloth $12.50.

This publication, sponsored by the Committee for Study of Sex Variants, represents a healthy step towards the solution of a problem frequently confused by bias, misunderstanding and inadequate information. The records of eighty selected cases equally divided in men and women are subjected to a careful study, grouped according to the extent to which they deviate from heterosexual adjustment. All of these cases received a physical examination, including pelvic examination of the women. Studies included roentgenograms of the skull, chest and pelvis and geneological charts. An appendix contains chapters on the gynecology of homosexuality with a series of excellent diagrams, a useful glossary, the results of the masculinity and femininity tests and a comparative study of the constitutional make-up of the cases as revealed by roentgen anthropometry. Conclusions are drawn from the various studies, but there is sufficient data for the reader's independent evaluation of evidence. Although society is unlikely to accept the sex variant under any circumstances, it is

hoped that this and other such studies will bring about a better understanding and handling of the problems by the medical profession.

These volumes are a far cry from the usual work on this subject, which is frequently merely a tawdry recitation of the experiences of the sex variant. The subject matter is well organized and written in a simple, direct style, unusual in this topic and constitutes a notable contribuion to a subject long steeped in ignorance and prejudice.

Southern Medical News

ALABAMA

The Jefferson County Medical Society, Birmingham, announces its Third Annual Postgraduate Seminar, to be held in Society Auditorium in the Outpatient Building at Hillman Hospital, Monday and Tuesday, September 15-16. The program will start at 2:00 p. m. on Monday, with an evening session and a barbecue Tuesday evening. Physicians on the program are: Dr. Isaac A. Bigger, Professor of Surgery, Medical College of Virginia, Richmond, Virginia; Dr. Elmer G. Wakefield, Assistant Professor of Medicine, University of Minnesota School of Medicine, Rochester, Minnesota; Dr. C. M. MacBryde, Assistant Professor of Medicine, Washington University School of Medicine, St. Louis, Missouri; Dr. F. H. Falls, Professor of Obstetrics and Gynecology, University of Illinois School of Medicine, Chicago, Illinois; Dr. Foster Kennedy, Professor of Clinical Neurology, Cornell University School of Medicine, New York, New York; and Dr. Joseph Stokes, Jr., Professor of Pediatrics, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania. Physicians from Alabama and adjoining states are invited. There will be no registration fee.

There is a county-wide movement to raise $15,000 for the laboratory equipment of the pellagra clinic conducted by Dr. Tom D. Spies at Hillman Hospital, Birmingham. Mr. Thomas Bragg and Mr. John W. Porter, Industrialists of Birmingham, are co-chairmen of this movement. A large portion of this fund has already been raised.

Deaths

Dr. A. Wilbur Breedlove, Downs, aged 68, died recently.

Dr. Carl A. Harris, Bessemer, aged 54, died June 15.

Dr. L. A. Jenkins, Birmingham, aged 76, died June 22 of heart disease.

Dr. Walter Branham Hendrick, Hurtsboro, aged 72, died recently of cholecystitis and coronary heart disease.

Dr. Manley Lane Morgan, Luverne, aged 70, died recently.

Dr. J. Newell Cunningham, Birmingham, aged 42, died July 3.

Dr. R. L. Mitchell, Warrior, aged 73, died July 2.

Dr. George H. Fisher, Sparks Gap, aged 72, died July 8.

Dr. Horace Percy Wilkins, Birmingham, aged 74, died recently.

ARKANSAS

Staff appointments to the State Hospital for Nervous Diseases are Dr. A. C. Kolb, Hope, Superintendent; Dr. N. T. Hollis, Little Rock, Assistant Superintendent and Clinical Director; and Dr. A. C. Watson, Little Rock, Superintendent of Benton Unit.

The following have been appointed to the Medical Advisory Boards for the Selective Service System in Arkansas: Dr. I. R. Johnson, Blytheville; Dr. R. R. Kirkpatrick, Texarkana; Dr. E. B. Swindler, Stuttgart; Dr. T. S. Van Duyn, Stuttgart; Dr. C. K. Townsend, Arkadelphia; Dr. S. N. Doane, Arkadelphia; Dr. N. E. Fraser, Conway; Dr. H. Fay H. Jones, Little Rock; Dr. L. H. Lanier, Texarkana; and Dr. T. F. Kittrell, Texarkana.

Dr. Ellery C. Gay, Little Rock, has been called to active service as Captain, Medical Corps, and assigned to Station Hospital, Fort Leavenworth, Kansas.

Dr. John M. Stewart, Van Buren, has been elected Surgeon of the Van Buren Legion Post.

New appointments at the University of Arkansas School of Medicine, Little Rock, are Dr. Byron L. Robinson, Dean, and Dr. S. C. Fulmer, Assistant Dean.

Dr. Paul Mahoney, Little Rock, has been elected First Vice-President of the University of Arkansas Alumni Association.

Dr. Howard A. Dishongh, Little Rock, has been elected Treasurer of the Arkansas Tuberculosis Association.

Dr. S. A. Drennen, Stuttgart, and Dr. Jos. F. Shuffield, Little Rock, have been elected President and First Vice-President, respectively, of the Arkansas Wildlife Federation.

State Medical Board of the Arkansas Medical Society has elected Dr. E. A. Callahan, Carlisle, President; Dr. R. J. Haley, Jr., Paragould, Vice-President; and Dr. L. Owens, Harrison, Secretary.

Dr. B. D. Luck represented the Pine Bluff Rotary Club at the International Convention in Denver.

Dr. R. M. Jernigan, Jonesboro, and Mrs. Lilian Cravens, Springdale, were married recently.

Deaths

Dr. Isaac Hall Emison, Russellville, aged 86, died recently.

Dr. John Cicero Hughes, Hoxie, aged 64, died recently of heart disease.

Dr. L. E. Lane, Dardanelle, aged 88, died recently.

Dr. Aaron A. McKelvey, Van Buren, aged 74, died recently.

Dr. John James Smith, Paris, aged 87, died recently of myocarditis.

DISTRICT OF COLUMBIA

Medical Society of the District of Columbia, at its recent annual meeting, installed Dr. Henry R. Schreiber, President; and elected Dr. A. Magruder MacDonald, President-Elect; Dr. J. Lawn Thompson, Jr., First Vice-President; and Dr. Grace G. Purse, Second Vice-President, all of Washington.

The annual Scientific Assembly of the Medical Society of the District of Columbia will be held at the Mayflower Hotel, Washington, September 30-October 1-2.

Dr. Walter O. Teichmann, Washington, was presented a cash award and a certificate at the forty-fourth annual dinner of the Washington Medical and Surgical Society, an award given annually for the best scientific paper presented during the year at a meeting of the Society.

George Washington University Medical Society has installed Dr. Howard P. Kane, President; and elected Dr. William Earl Clark, President-Elect; Dr. W. M. Ballinger, First Vice-President; Dr. Esther Nathanson, Second Vice-President; and Dr. Oscar B. Hunter, Secretary-Treasurer.

Jacobi Medical Society has elected Dr. Samuel Dessoff, President; Dr. Leon Gordon, Vice-President; Dr. Sander Lachman, Secretary; and Dr. Joel Novick, Treasurer, all of Washington.

Woman's Medical Society has elected Dr. Helen Gladys Kain, President; Dr. Agnes McNutt, Vice-President; Dr. Inez Wilber, Recording Secretary; Dr. Carolina Jackson, Corresponding Secretary; and Dr. Elizabeth Parker, Treasurer, all of Washington.

Georgetown University School of Medicine has been presented by the class of 1941 a $10,000 life insurance policy which, upon maturity, will be known as the David V. McCauley Endowment Fund.

Washington Sanitarium dedicated a new addition recently which will be known as the Lisner Memorial in honor of its donor, Mrs. Laura Hartmann Lisner, Washington.

American Psychiatric Association has elected Dr. Elmer Klein, Washington, to fellowship and admitted to membership Dr. Alexander Halperin, Dr. Miriam Frances Dunn and Dr. Andrew Browne Evans, all of Washington.

Dr. Emmett H. Markwood, Washington, was recently elected President of the Mount Pleasant Citizens' Association.

Dr. G. Victor Simpson was recently elected President of the Canadian Club of Washington, a club made up of former Canadians living in Washington.

Dr. Hugh O. House, Washington, has been appointed a member of the Board of Police and Fire Surgeons, succeeding the late Dr. James H. Farley.

Dr. Edward Y. Davidson was recently presented the Order of Merit of the Medical Society of the District of Columbia, a certificate which will be awarded annually in the future to the physician deemed to have made the most worthwhile contribution to the Society.

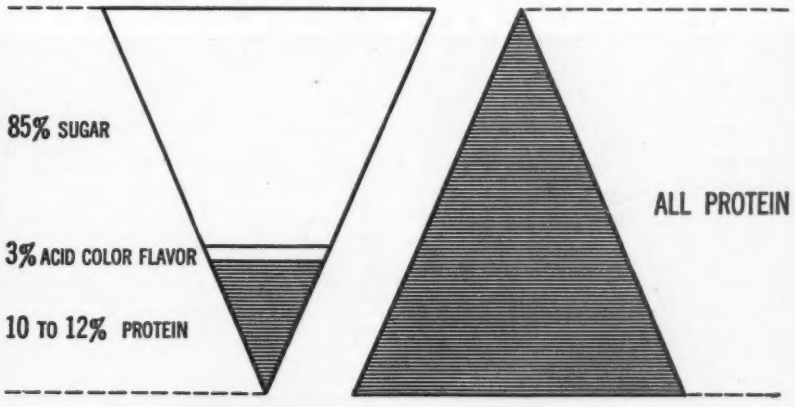
Dr. Daniel L. Borden, Washington, reported for service July 1 as Lieutenant-Colonel in the Medical Corps and will become Chief Surgeon of the new thousand-bed hospital at Fort Meade, Maryland. In the World War I, Dr. Borden served overseas as Chief Surgeon of Evacuation Hospital 18.

The American Association for the Study of Neoplastic Diseases will hold its annual meeting at Washington, September 4-6.

Dr. Albert G. Love, Brigadier General, Medical Corps, U.S.A., on duty in Washington, retired from active service recently on account of reaching the statutory retirement age, the War Department announced.

Continued on page 34

WHAT IS THE DIFFERENCE BETWEEN GELATINE DESSERT POWDERS AND KNOX GELATINE?



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Continued from page 898

DEATHS

Dr. James Hugh Earley, Washington, aged 44, died recently of heart disease.

FLORIDA

Broward County Medical Society has elected Dr. Frank Denniston, President; Dr. M. N. Camp, Vice-President; and Dr. E. C. Chamberlain, Secretary-Treasurer, all of Fort Lauderdale.

Manatee County Medical Society has elected Dr. W. E. Wentzel, President; and Dr. W. D. Sugg, Secretary-Treasurer, both of Bradenton.

Florida Section, American College of Physicians, has elected Dr. W. Wellington George, West Palm Beach, President; and Dr. Kenneth Phillips, Miami, Secretary, reelected.

Florida Association of Dermatology and Syphilology at it annual meeting held in Jacksonville elected Dr. Wiley M. Sams, Miami, President; and Dr. Lauren M. Sompayrac, Jacksonville, Secretary, reelected.

Florida Association of Industrial Surgeons at its recent meeting elected Dr. Frank D. Gray, Orlando, President-Elect; Dr. W. G. Harris, Jacksonville, Vice-President; and Dr. Kenneth A. Morris, Jacksonville, Secretary-Treasurer.

Florida Society of Ophthalmology and Otolaryngology has elected Dr. S. B. Forbes, Tampa, President; Dr. Shaler Richardson, Jacksonville, Vice-President; and Dr. C. E. Dunaway, Miami, Secretary, reelected.

Florida Radiological Society has elected Dr. John N. Moore, Ocala, President; Dr. Elliott M. Hendricks, Fort Lauderdale, Vice-President; and Dr. Walter A. Weed, Orlando, Secretary-Treasurer.

Dr. George H. Putman has moved to Sanford and located in the offices formerly occupied by Dr. T. F. McDaniel who has been called into military service.

Dr. Julius R. Pearson, Miami Beach, recently took a graduate course in internal medicine at the Pennsylvania Hospital, Philadelphia.

Dr. James R. Norton and Miss Brownie Miller Carter, both of Port St. Joe, were married recently.

Dr. A. Mackenzie Manson, Jacksonville, and Miss Virtrece Adams, Nashville, Tennessee, were married recently.

DEATHS

Dr. William Edward Foy, Fort Pierce, aged 33, died recently of coronary occlusion.

Dr. E. W. Gammon, Orlando, aged 74, died recently.

Dr. William Andrew Haggard, Miami, aged 56, died recently of coronary sclerosis.

Dr. Charles G. Holland, Greenville, aged 80, died recently of diabetes mellitus.

Dr. A. J. Kershaw, Miami, aged 58, died recently of injuries received in an automobile accident.

Dr. Arthur Wesley Knox, Sanford, aged 57, died recently of cerebral hemorrhage.

Dr. Joseph Michael O'Maley, Miami, aged 68, died recently of coronary sclerosis and bronchopneumonia.

Dr. Leon Thayer Stem, Sarasota, aged 57, died recently of uremia due to mitral regurgitation.

Dr. Jesse M. Willis, Williston, aged 76, died recently of cerebral hemorrhage.

GEORGIA

Medical Association of Georgia at its recent annual meeting in Macon installed Dr. Allen H. Bunce, Atlanta, President; and elected Dr. James A. Redfearn, Albany, President-Elect; Dr. Hudnall G. Weaver, Macon, and Dr. Bannester Lester Harbin, Rome, Vice-Presidents; and Dr. Edgar D. Shanks, Atlanta, Secretary, reelected. The next annual meeting will be held in Augusta.

It has been announced that a fund of $10,000 has been raised by members of the Medical Association of Georgia to carry on a campaign for health education in rural districts and to provide care for needy physicians and their families.

Dr. Robert B. Greenblatt, Professor of Experimental Medicine, University of Georgia School of Medicine, Augusta, received the Crawford W. Long Memorial Award for his paper showing outstanding research on menometrorrhagia.

Continued on page 36

THE NEW YORK POLYCLINIC

MEDICAL SCHOOL AND HOSPITAL

(ORGANIZED 1881)

(The Pioneer Post-Graduate Medical Institution in America)

Physical Therapy

Didactic lectures and active clinical application of all present-day methods of physical therapy in internal medicine, general and traumatic surgery, gynecology, urology, dermatology, neurology and pediatrics. Special demonstrations in minor electrosurgery, electrodiagnosis, fever therapy, hydrotherapy, including colonic therapy, light therapy.

Roentgenology

A comprehensive review of the physics and higher mathematics involved, film interpretation, all standard general roentgen diagnostic procedures, methods of application and doses of radiation therapy, both x-ray and radium, standard and special fluoroscopic procedures. A review of dermatological lesions and tumors susceptible to roentgen therapy is given, together with methods and dosage calculation of treatments. Special attention is given to the newer diagnostic methods associated with the employment of contrast media such as bronchography with Lipiodol, uterosalpingography, visualization of cardiac chambers, perirenal insufflation and myelography. Discussions covering roentgen departmental management are also included.

FOR INFORMATION ADDRESS

MEDICAL EXECUTIVE OFFICER, 345 West 50th Street, NEW YORK CITY

The diagnostic value of any radiograph is, in the final analysis, dependent upon the specialized knowledge of the one who makes the interpretation. That is why consultation with urologist and radiologist is of such importance in cases of possible urological complications.

Intravenous urography is unquestionably one of the most important and accurate procedures in diagnostic radiology * * *

Those experienced in this field know that tuberculosis; tumors (benign or malignant); cortical necrosis of various types (abscess or carbuncle); calculi (pelvic, calyceal, or ureteral); hydronephrosis with marked or slight kidney damage from congenital abnormalities such as aberrant vessels; ureteral obstructions from bands or adhesions; urinary extravasations from rupture of the kidney, or extravasations from rupture from infection, or perinephritic abscess can usually be demonstrated by this examination.—SOUTH. M. J., *32*: 150, 153, February, 1939.

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World's largest manufacturer of radiographic and photographic materials

Continued from page 34

Georgia Pediatric Society has elected Dr. E. N. Gleason, Savannah, President; Dr. F. B. Schley, Columbus, President-Elect; Dr. Harry Lange, Atlanta, Vice-President; Dr. Don F. Cathcart, Atlanta, Secretary-Treasurer.

University of Georgia Alumni Association has elected Dr. Charles L. Ridley, Macon, President; Dr. John J. Pilcher, Wrens, Vice-President; and Dr. Henry A. Seaman, Waycross, Second Vice-President.

Dr. E. G. Kirby, Bowdon, has been reelected President of the Georgia Educational Association.

Dr. L. P. Longino, has been appointed Superintendent of the Milledgeville State Hospital, Milledgeville; and Dr. Edward W. Schwall, Clinical Director.

Dr. John W. Oden, formerly of Milledgeville, has been appointed Medical Superintendent for Georgia Training School for Mental Defectives at Gracewood.

Dr. Edward Y. Walker, formerly of Atlanta, accepted a position on the staff of the Baldwin Memorial Hospital at Milledgeville.

Dr. William T. Edwards, Jr., has opened his office in the Medical Arts Building, Atlanta, for the practice of diseases of the eye.

Dr. Martin Van Term, Marietta, has been elected to fellowship in the American College of Physicians.

Chicago Eye, Ear, Nose & Throat College
Established 1897
231 W. Washington St., Chicago, Ill.
Practical postgraduate course in Ophthalmology and Otolaryngology.
Doctors admitted at any time for review and clinical observation.
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Director

Department of Graduate Medicine
1430 Tulane Avenue, New Orleans, La.

Dr. Ralph N. Johnson, Rome, has moved his office to the McCall Hospital.

Dr. Albert Louis Evans, Sandersville, and Miss Lena Lovett, Wrightsville, were married recently.

DEATHS

Dr. George Washington Heriot, Jr., aged 37, died recently.

Dr. James Madison Horne, Finleyson, aged 74, died recently.

Dr. James Henry Johnson, Columbus, aged 75, died recently.

Dr. Welcolm Tol Kelley, Pinehurst, aged 30, died recently in an automobile accident.

Dr. David de Will Moncrief, Atlanta, aged 64, died recently.

Dr. Elias W. Ragsdale, Tignall, aged 71, died recently of heart disease.

Dr. Ledford A. Williams, Abbeville, aged 75, died recently of pneumonia.

KENTUCKY

Dr. August Schachner, Louisville, has given a collection of 1,000 medical volumes for the use of Negro physicians.

Dr. Maurice Kaufman, Cumberland, and Miss Sara E. Combs, Manchester, were married recently.

DEATHS

Dr. James Wilbur Brandon, Big Clifty, aged 59, died recently of cerebral hemorrhage.

Dr. Charles W. Evans, Middlesboro, aged 81, died recently of bronchopneumonia.

Dr. Sarah Felt Richardson, Munfordville, aged 70, died recently.

Dr. John Steele Sweeney, Paris, aged 63, died recently of cirrhosis of the liver.

Dr. Edgar Allen Whitmer, Louisa, aged 65, died recently of coronary occlusion.

LOUISIANA

Southern Section of the Society for Experimental Biology has elected Dr. Albert E. Casey, Chairman; Dr. Isidore Cohn, Vice-Chairman; and Dr. W. A. Sodeman, Secretary, all of New Orleans.

Dr. F. L. Jaubert, New Orleans, has been reelected President of the Louisiana Society for Crippled Children.

Dr. Curtis H. Tyrone was recently appointed to the Board of Directors of the Department of Public Welfare of the City of New Orleans.

Dr. Howard Mahorner, New Orleans, was elected to membership in the American Association for the Study of Goiter at the annual meeting in Boston.

A Portrait Medallion of Dr. Rudolph Matas, New Orleans, was unveiled at the Touro Infirmary on June 24.

Dr. Rudolph Matas, New Orleans, received the Times-Picayune Loving Cup for 1940, an award given by the newspaper since 1901 to a New Orleans citizen for achievement redounding to the benefit of the city and its people.

Dr. Robert S. Teague, Jr., Instructor in Pharmacology, Tulane University of Louisiana School of Medicine, New Orleans, was recently awarded the Lewis Cass Ledyard, Jr., Fellowship for medical research. The award, providing $4,000, is made annually to a young physician or surgeon demonstrating fitness to carry on original research of high order.

Dr. W. L. Smith, Senior Surgeon, U. S. Public Health Service, has been relieved from duty at the U. S. Marine Hospital in New Orleans and ordered to Kentucky.

Dr. Robert Prosser Morrow, Jr., New Orleans, and Miss Lelia Terry, Laurel, Mississippi, were married recently.

Dr. Alyce Mary Arretteig and Mr. John Watkins Williams, Jr., both of Pineville, were married recently.

Dr. Alfred Penn Crain, Shreveport, and Miss Paula Potts, Natchitoches, were married recently.

DEATHS

Dr. George Reed Carroll, Lillie, aged 69, died recently of pulmonary tuberculosis and empyema.

Dr. Paul H. Herron, Oak Ridge, aged 37, died recently.

Dr. Brown Word, Leesville, aged 58, died recently.

MARYLAND

The first unit of the U. S. Naval Medical Center at Bethesda, costing $4,850,000, with a normal capacity of 650 beds, is near-

Continued on page 38

Dehydrated Human Plasma Sealed under Vacuum!

IT IS with real pride of achievement that the Mulford Biological Laboratories of Sharp & Dohme have announced a practical method of making available to every physician and hospital in this country one of today's most important contributions to medicine—normal human plasma.

Twelve years ago, the Mulford Biological Laboratories undertook a program of cooperative research which led to refinement of a method of preserving labile biological substances—a unique process involving rapid freezing and vacuum dehydration from the frozen state together with preservation under vacuum. The full time of numerous investigators was devoted to research in this field before 'Lyovac' biological products evolved as a practical and useful contribution to medical progress.

Today, 'Lyovac' Normal Human Plasma brings to every physician and hospital a dehydrated plasma which retains its therapeutic value and remains stable for at least five years. Restoration to the fluid state is simple and rapid . . . pooled plasma obviates the necessity of typing or cross matching . . . it does not cause or increase hemoconcentration . . . the content of antibodies, complement and coagulating elements remains essentially unchanged from that of the original fresh plasma.

HOW SUPPLIED

In flame-sealed ampoule-vials to yield 250 cc. of plasma when restored to original volume, together with a separately-supplied intravenous injection outfit.

'Lyovac' NORMAL HUMAN PLASMA

• Sharp & Dohme
PHILADELPHIA, PA.

Continued from page 36

ing completion. The entire plant occupies more than 200 acres and replaces existing facilities in Washington which are considered inadequate.

Dr. Hugh H. Young, Baltimore, is one of four scientists to be awarded the Amory Prize of $17,200 at the annual meeting of the American Academy of Arts and Sciences in Boston, recently. The prize, awarded for the first time, recognized the contributions of these investigators to the treatment and cure of diseases of the genito-urinary system.

Dr. Adolph Meyer, Professor of Psychiatry, Johns Hopkins University School of Medicine since 1910, and Director of the Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital, Baltimore, recently retired. He is succeeded by Dr. John Clare Whitehorn, Professor of Psychiatry, Washington University School of Medicine, St. Louis, Missouri.

Dr. Montgomery A. Stuart, Captain, Medical Corps, U. S. Navy, and Mrs. Charles Fague Williams were married at Annapolis recently.

Deaths

Dr. James Harvey Baldwin, Baltimore, aged 69, died recently of arteriosclerosis.

Dr. Charles H. Beetem, Baltimore, aged 71, died recently of chronic nephritis.

Dr. Julius Friedenwald, Baltimore, aged 74, died June 8 of carcinoma of the bladder.

MISSISSIPPI

Dr. Marshall Louis Michel, Jr., Biloxi, and Miss Nancy Shaw, New Orleans, Louisiana, were married recently.

Deaths

Dr. Jacob Moon Anderson, Sardis, aged 72, died recently following a heart attack.

Dr. Roland Houston Cranford, Laurel, aged 61, died recently of angina pectoris and acute nephritis.

Dr. R. A. Creekmore, Calhoun City, aged 67, died recently.

Dr. Cleveland Davis, Itta Bena, aged 57, died recently.

Dr. Sydney William Johnson, Vicksburg, aged 62, died recently of coronary thrombosis.

Dr. George M. Shaw, Robinsonville, aged 78, died recently.

Dr. James E. Wyatt, Prairie Point, aged 85, died recently.

MISSOURI

American Proctologic Society has elected Dr. Frederick B. Campbell, Kansas City, President; and Dr. George H. Thiele, Kansas City, Treasurer.

Dr. Harry L. Alexander, St. Louis, Associate Professor of Clinical Medicine, has been appointed Professor of Clinical Medicine and acting head of the Department of Internal Medicine Washington University School of Medicine, to succeed Dr. David P. Barr, who resigned to accept an appointment at Cornell University Medical College, New York.

Dr. James Stewart, Jefferson City, has been appointed State Health Commissioner by the Governor. Dr. Stewart served as State Health Commissioner from 1925 to 1933.

The Library at Washington University School of Medicine, St. Louis, recently received thirty-one volumes, principally on neurology and psychiatry, the gift of Dr. Samuel Treat Armstrong, Katonah, New York.

Dr. Robert J. Terry, Professor of Anatomy, Washington University School of Medicine, St. Louis, has retired and will be succeeded by Edmund V. Cowdry, Ph.D., Professor of Cytology.

Deaths

Dr. Andrew Jackson Clay, St. Charles, aged 51 died recently of heart disease.

Dr. Elizabeth E. Gross, Kansas City, aged 74, died recently of arteriosclerosis, diabetes mellitus and chronic nephritis.

Dr. Herbert H. Kilpatrick Kirk, St. Louis, aged 78, died recently of nephritis and myocarditis.

Dr. Abram C. Leggat, Ferguson, aged 68, died recently of heart disease.

Dr. Homer Odessa Leonard, Kansas City, aged 88, died recently.

Dr. John M. McClanahan, Guilford, aged 81 died recently of valvular heart disease.

Dr. Henry F. Rhodes, Philadelphia, aged 82, died recently.

Dr. Homer E. Songer, Kansas City, aged 65, died recently of bronchopneumonia.

Dr. Robert Blake Tyler, Joplin, aged 87, died recently.

Dr. John Jay Williams, St. Louis, aged 88, died recently of chronic myocarditis and arteriosclerosis.

NORTH CAROLINA

North Carolina State Medical Association has installed Dr. F. Webb Griffith, Asheville, President, and elected Dr. Donnell B. Cobb, Goldsboro, President-Elect; Dr. Thomas D. Sparrow, Charlotte, and Dr. Thomas L. Carter, Gatesville, Vice-Presidents; and Dr. Roscoe D. McMillan, Red Springs, Secretary-Treasurer. Charlotte has been chosen for the 1942 meeting place.

At the University of North Carolina, Chapel Hill, an extensive research program on hookworm and malaria is being carried on, the aim to solve the problems encountered when hookworm and malaria infections are present in the same patient. Dr. James C. Andrews, of the School of Medicine, and Dr. Harold W. Brown, of the School of Public Health, are directing the project between the two departments. This work has been in progress two years and is supported by a grant from the Samuel S. Fels Fund, of Philadelphia, the Directors of which have extended aid to the work for a further two-year period.

North Carolina Tuberculosis Association, at its recent annual meeting in Greensboro, elected Dr. C. W. Armstrong, Salisbury, President; Dr. William H. Smith, Goldsboro, Vice-President; Dr. H. L. Brockman, High Point, Secretary; and Dr. Robert Brawley, Winston-Salem, Treasurer.

Dr. Carl V. Reynolds, State Health Officer for North Carolina, has been elected Vice-President of the Association of State, Territorial and Provincial Health Authorities of North America, an organization composed of health authorities from the United States, its territorial possessions and the provinces of Canada.

Dr. William Allan, Charlotte, has been appointed Head of a Department of Eugenics at the new Bowman Gray School of Medicine of Wake Forest College, Winston-Salem. The Department will be financed by a grant from the Carnegie Foundation of New York. Dr. Allan is Visiting Professor of Medicine at the

Continued on page 42

DR. MOODY'S SANITARIUM

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For Nervous and Mental Diseases, Drug and Alcohol Addiction and Nervous Invalids Needing Rest and Recuperation

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The significance of such results is obvious. Not only are patients incapacitated for a very short time but the rapid eradication of parasites largely prevents anemia, splenomegaly and other chronic complications of malaria.

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VEGEX-VITAFOOD DRIED BREWERS YEAST

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Since the Mississippi flood in 1928, Vegex-Vitafood Dried Brewers' Yeast has increasingly become the outstanding source of Goldberger's P-P (pellagra-preventive) factor, particularly among health departments and physicians.

Initially, the President of the Company, with a long experience in food and drug administration, the author of one of the first, if not the first, of the laws against medical advertising frauds, determined to and did place the use of this yeast entirely under the direction of physicians and health departments. It has been, with the physician's other treatment, a dependable aid in lowering the pellagra death rate as comparative vital statistics are showing.

And Then

Another outstanding thing has been done. It has been demonstrated that when a product is supplied at a price which people of low incomes can pay, supplied through the wholesaler and retailer and then all treatment directed to the neighborhood physician and health department, a fatal scourge, even during the depression, through the private practitioner, is being conquered.

The Two Types

There are two types of Vegex-Vitafood Dried Brewers' Yeast, the Red Label has the hop flavor removed; the Green Label retains the hop flavor. Both types are packed in one-half pound, one, two and five pound cans or fifty and one hundred pound bags.

This yeast assays 50 International B^1 units per gram and 40 Sherman-Bourquin B^2G (riboflavin) units per gram and supplies the whole of the vitamin B complex. It is high in Goldberger's P-P (pellagra-preventive) factor including the nicotinic acid fraction.

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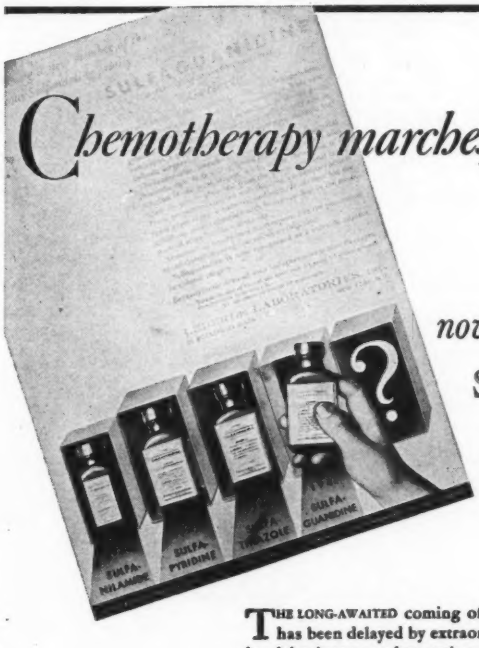

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Meanwhile, small lots of Sulfadiazine from the pilot plant have been going to leading clinicians for a year or more and the following impressive accumulation of highly favorable published references from the foremost authorities already attests the importance of this newest sulfonamide.

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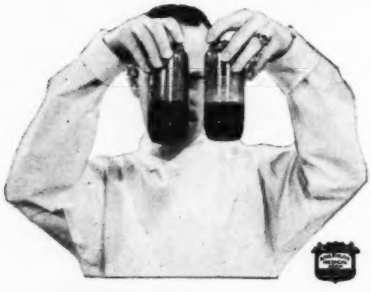

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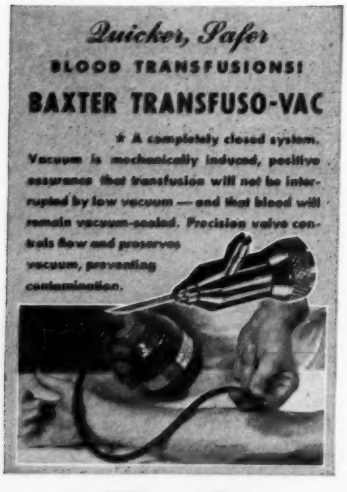
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Continued from page 38

Medical College of Virginia, Richmond, and Director of a Family Record Department at Memorial Hospital, Charlotte.

Dr. James B. Whittington, Medical Director of the City Hospital of Winston-Salem, has been appointed Head of a Department of Hospital Administration, Bowman Gray School of Medicine, Winston-Salem.

Dr. James L. Davis, who has been practicing at Thacker Mines, West Virginia, is now located in Waynesboro.

Dr. Alfred Blumberg, Asheville, has been assigned to Station Hospital, Camp Shelby, Mississippi, with the rank of Major.

Dr. Rush Shell, Charlotte, has been appointed a Fellow in the American College of Radiology.

Dr. Arthur Calvin Broughton, Jr., and Miss Mary Frances Hunter, both of Raleigh, were married recently.

Dr. Duncan Graham Calder, Jr., Charlotte, and Miss Mary Frances Barnhardt, Concord, were married recently.

Deaths

Dr. Ira Marshall Fisher, Oriental, aged 60, died recently.

Dr. George William Kutscher, Jr., Asheville, aged 44, died recently.

Dr. Claudius Cameron Joyner, Farmville, aged 68, died recently of coronary thrombosis.

OKLAHOMA

Oklahoma State Medical Association, at its annual meeting, installed Dr. Finis W. Ewing, Muskogee, President, and elected Dr. J. D. Osborn, Frederick, President-Elect; Dr. C. R. Rountree, Oklahoma City, Vice-President; and Dr. L. J. Moorman, Oklahoma City, Secretary-Treasurer.

Dr. Berry Campbell, Assistant Professor of Medicine, University of Oklahoma School of Medicine, Oklahoma City, who has been on a leave of absence while studying at the Rockefeller Institute of Medical Research on a Guggenheim Fellowship, has been reappointed for a continuation of this fellowship for the scholastic year 1941-42. Dr. Russell L. Moseley will continue to fill his place in the Department of Anatomy.

Deaths

Dr. Ambert Young Easterwood, Ardmore, aged 69, died recently.

Dr. Calbert Harvey Beach, Glencoe, aged 80, died recently.

Dr. J. E. Jones, Hollis, aged 77, died recently.

Dr. Peter Cope White, Tulsa, aged 52, died recently.

SOUTH CAROLINA

Dr. Harry F. Wilson, State Board of Health, Columbia, Major, Army Medical Reserve Corps, U. S. Army, has been ordered to active duty for a period of one year. Major Wilson will be assigned to Fort Meade, Maryland.

Dr. William Atmar Smith, Charleston, was elected Vice-President of the American Trudeau Society at its annual meeting in San Antonio, Texas, recently.

Dr. George R. Wilkinson, Greenville, has been elected President of the Greenville County Mental Hygiene Society, recently organized.

Dr. Thomas H. Pope, Newberry, has been elected Vice-President of the Board of Trustees of the Medical College of the State of South Carolina.

Dr. I. Grier Linton, Charleston, has been called to active duty at the Charleston Navy Yard.

Dr. William T. Rice, of the staff of Roper Hospital, Charleston, has moved to New Castle, Pennsylvania.

Dr. A. W. Welling, formerly of Newberry, is now stationed at Camp Livingston.

Dr. W. B. Timmerman, Hartsville, has entered Army service and is stationed at Camp Wheeler.

Dr. H. R. Coleman has moved to Columbia, where he will practice ophthalmology and otolaryngology.

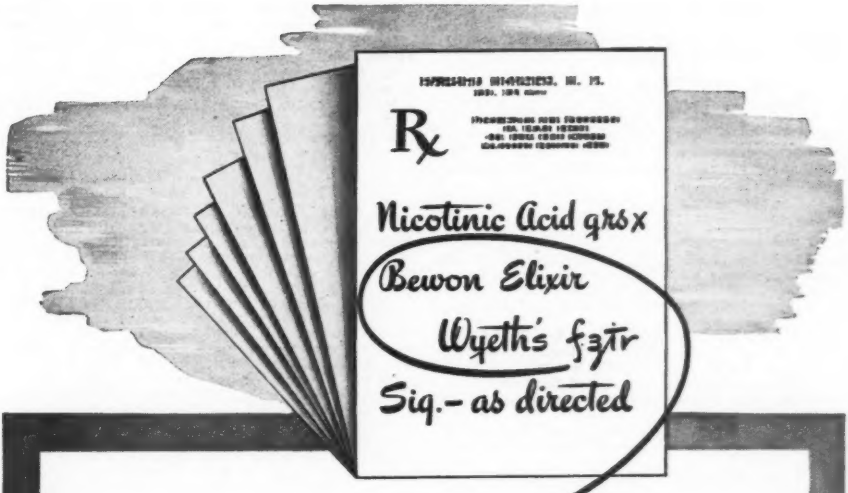
Dr. Landon D. Walker, formerly of Charlotte, is now doing general practice in Pageland.

Dr. George R. Cousar, Medical Missionary in the Belgian Congo for the past few years, is established in Bishopville and is taking care of the practice of his brother, Dr. John B. Cousar.

Dr. Isaac H. Grimball, Greenville, was elected President of the South Carolina Pediatric Society at its recent annual meeting.

Dr. John Hansford Thomas, Jr., Greenville, and Miss Mary Johnston Lasley, Stanton, were married June 19.

Continued on page 44



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Supplied in pint and gallon bottles

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John Wyeth and Brother Incorporated PHILADELPHIA

Continued from page 42

Dr. Arthur J. Butt, Fort Jackson, and Miss Florence Barbara McCravy, Columbia, were married recently.

DEATHS

Dr. John Malcolm Chapman, Greenville, aged 53, died recently.

Dr. Charles Cyrus Grant, Rock Hill, died recently.

Dr. Willard G. Hearin, Greenville, aged 54, died July 9.

Dr. Edna Simpson Valentine, Columbia, aged 57, died recently of bronchial asthma and pneumonia.

TENNESSEE

West Tennessee Medical and Surgical Association has elected Dr. V. E. Massey, Huntington, President; Dr. A. T. Hicks, Camden, and Dr. C. E. Bolen, Wildersville, Vice-Presidents; Dr. George McSwain, Paris, Secretary, reelected; and Dr. John Jackson, Dyer, Assistant Secretary.

Middle Tennessee Medical Society has elected Dr. T. C. Rice, Franklin, President; Dr. V. H. Griffin, Clarksville, Vice-President; and Dr. R. A. Daniel, Jr., Nashville, Secretary.

Dr. Hugh J. Morgan, Nashville, was elected Secretary of the Association of American Physicians at its annual meeting in Atlantic City recently.

Dr. W. Likely Simpson, Memphis, was elected President of the American Broncho-Esophagological Association at its recent meeting.

Dr. Bruce Rankin McCampbell and Miss Faye Williams, Memphis, were married recently.

Dr. Robert Mark Finks, Nashville, and Miss Josephine Elizabeth King were married recently.

Dr. Gerrit John Buddingh and Miss Alice Mitchell, both of Nashville, were married recently.

DEATHS

Dr. Joseph Warren Bailey, Chattanooga, aged 75, died recently of diabetes mellitus, gangrene of the left foot and uremia.

Dr. R. Boyd Bogle, Nashville, aged 66, died recently.

Dr. James Ellis Carson, Maryville, aged 59, died recently.

Dr. William Monroe Edens, Estill, aged 81, died recently.

Dr. L. T. Stem, formerly of Chattanooga, recently of Sarasota, Florida, aged 57, died recently.

Dr. Benjamin Alexis Sherrell, Dellrose, aged 79, died recently of cerebral hemorrhage.

Dr. Asa Kelley Shelton, Oliver Springs, aged 84, died recently.

Dr. Wilborn Roper Winter, Lebanon, aged 73, died recently.

TEXAS

The Board of Regents of the University of Texas has authorized year around operation of the University of Texas School of Medicine, heeding a request of the Federal Government for more physicians for national defense planning. A medical student will be enabled to complete his training in three years instead of the normal four years of three-quarters each.

The Bell Memorial Hospital, Columbus, has been leased by a group of Columbus citizens, who will operate it on a non-profit basis. This hospital, owned and operated by Dr. R. H. Bell, was made available rent-free when Dr. Bell was ordered to active duty in the Medical Corps. Dr. Bell is a Major and will be stationed at Camp Wallace, Texas.

The new wing to the Dallas Methodist Hospital, costing $75,000, and which will house about seventy-five patients, was recently completed.

Dr. Sidney M. Lister and Dr. J. Edward Hodges, two of the founders of Jefferson Davis Hospital, Houston, were recently honored at a dinner on their retirement from the active staff of the hospital. They were presented silver keys in token of their long service.

Dr. Preston Hunt and Mrs. William Hibbitts, Texarkana, Presidents of the State Medical Association of Texas and of the Woman's Auxiliary to the State Medical Association, respectively, were recently honored at a banquet.

Dr. Vance Terrell, Stephenville, has been doing postgraduate work in otorhino-laryngology at the Indiana Medical College, Indianapolis.

Continued on page 46

Throw Away Your Plaster Shears!

Remove Major Plaster Bandage with Hot Water

When you use Major Plaster Bandages, you say goodbye to difficult cast removal. You and your patients alike will be pleased with these strong, lightweight casts, easily bivalved or removed without hard work on your part or pain to the patient. Major Bandages are put on with cold water, removed with hot water, by your choice of two methods. Immersing or sponging the cast with hot water allows you to unwrap it as you would any bandage. Or, the cast may be bivalved by scoring it when applied, then removed as shown at the right. Order a trial supply today . . . your satisfaction is guaranteed. Packed one dozen in a tin, priced as follows:

2″ x 3 yds., doz.... $1.45 4″ x 5 yds., doz.... $2.20
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Hot water from a syringe, applied along a scored line, makes bivalving of Major casts an easy matter.

The plaster is disintegrated by the water, leaving only the crinoline, cut with bandage scissors.

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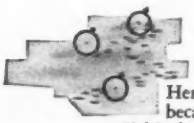

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HEMATINIC PLASTULES with LIVER CONCENTRATE
Suggested dosage—2 T. I. D. after meals.

BOTTLES OF 50 AND 100

Continued from page 44

Dr. Harvey C. Baldwin, Corpus Christi, was recently appointed City Physician, succeeding Dr. Dan Clark, who has been called into Army service.

Dr. E. M. Dunstan, Administrator of Parkland Hospital, Dallas, was recently given a testimonial dinner by friends and associates on the occasion of his entry into the medical service of the Army.

DEATHS

Dr. J. B. Shannon, Fort Worth, aged 59, died recently.
Dr. Joseph Meyer, Paris, aged 92, died recently.
Dr. Arthur Burns, Houston, aged 45, died recently.
Dr. Julian Howard Herndon, Miles, aged 64, died recently.
Dr. W. A. Starkey, Atlanta, aged 71, died recently.
Dr. E. M. F. Stephen, Galveston, aged 55, died recently.
Dr. Samuel B. McLeary, Columbus, aged 75, died recently.
Dr. Sam S. Templin, Galveston, aged 49, died recently.
Dr. Lee E. Parr, Beeville, aged 83, died recently.
Dr. Fred W. Cariker, Cushing, aged 69, died recently.
Dr. Charles P. Roberts, Galveston, aged 60, died recently.
Dr. Charles William Simpson, Dallas, aged 75, died recently.
Dr. William Penn Sims, Burkburnett, aged 52, died recently of coronary occlusion.
Dr. Harold Lynwood Warwick, Fort Worth, aged 63, died recently of carcinoma of the bladder.
Dr. Luther E. Wiggins, Joaquin, aged 63, died recently.
Dr. Leonard Holmes Bush, Huntsville, aged 75, died recently of coronary thrombosis.
Dr. Edward Paxton Daviss, Houston, aged 80, died recently of coronary occlusion and arteriosclerosis.
Dr. R. Johnson Dickerson, San Antonio, aged 62, died recently of chronic myocarditis.
Dr. Henry Hiram Panton, Corsicana, aged 59, died recently of angina pectoris.
Dr. Elza Marion Perry, Dallas, aged 39, died recently of injuries received in an automobile accident.
Dr. George W. Stevens, Austin, aged 81, died recently.
Dr. Vittorio E. Von Brunow, Pampa, aged 78, died recently of uremia and cardiorenal disease.

VIRGINIA

Danville-Pittsylvania Academy of Medicine has elected Dr. Charles W. Purcell, President; Dr. Snowden C. Hall and Dr. Walter McMann, Vice-Presidents; and Dr. Prentice Kinser, Jr., Secretary-Treasurer, all of Danville.

Fourth District and Southside Virginia Medical Society has elected Dr. J. B. Kiser, Emporia, President; Dr. B. H. Knight, Surry, and Dr. T. S. Jennings, Waverly, Vice-Presidents; Dr. Francis Taylor, Petersburg, Recording Secretary; and Dr. C. E. Martin, Emporia, Corresponding Secretary and Treasurer.

Norfolk County Medical Society has elected to take office October 1 Dr. M. S. Fitchett, President; Dr. A. Brownley Hodges, President-Elect; Dr. Mallory S. Andrews, Vice-President; and Dr. Lockburn B. Scott, Secretary-Treasurer, all of Norfolk.

In order to coordinate the Public Health activities of the City of Richmond the Mayor has appointed a Board of Health composed of Dr. Wm. H. Higgins, Chairman; Dr. Fred Fletcher, Dr. Emily Gardner and Dr. Robert Sycle, the Board's chief function to nominate a Commissioner of Health and an Epidemiologist and to act in an advisory capacity to these officers in all matters pertaining to the health of Richmond. Dr. Millard C. Hanson, of Pittsburg, a former Health Officer of Toledo, has been appointed Commissioner of Health of Richmond. Dr. R. M. Wilson is serving as active Epidemiologist of the Board of Health.

Dr. Willard L. Quennel has resigned as Medical Director of the Norfolk General Hospital and Mr. Willard P. Earngey, Jr., Superintendent of the Cherokee County Hospital, Gaffney, South Carolina, was appointed to succeed him.

Dr. R. L. Raiford, Franklin, was presented with a gold watch and chain engraved to express appreciation for his long service as Secretary of the Southside Virginia Medical Society.

Dr. E. T. Terrell was recently elected Head of the Williamsburg Lions Club.

Dr. John G. McNiel, who has just completed a postgraduate course in public health at Johns Hopkins, has been appointed Health Officer of Bristol-Washington Health Department with

Continued on page 48

Classified Advertisements

RATES for insertion in the Classified Column are as follows: $2.00 minimum, which includes the first 50 words; for each word in addition to the original 50 words, the charge is 3c.

EDITING—Preparation of papers and reports, indexing, abstracting, bibliographies and similar services to physicians. Address inquiries to Miss Elizabeth M. McFetridge, M.A., 4810 St. Charles Avenue, New Orleans, Louisiana.

POSITION WANTED—Position as laboratory and x-ray technician desired by woman, single. Sixteen years' experience as technician in doctor's office and small hospital. Also do general office assistant work, typing. Will begin at $100.00 per month with advancement. Write Dept. M-81, care JOURNAL, Birmingham, Alabama.

HOSPITAL SUPERINTENDENT DESIRES POSITION—Lay administrator with fifteen years' active experience, including large industrial hospital. Very thoroughly trained in all hospital problems, including reorganization, financing, and so forth. Available about August 15. References. Write Department C-88, care SOUTHERN MEDICAL JOURNAL, Birmingham, Alabama.

MICROSCOPE WANTED—Good instrument suitable for medical student. Price must be reasonable and the microscope must be in good condition. Write Rex G. Finley, Decatur, Alabama.

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DETERMINATION OF ALCOHOL IN BLOOD AND URINE

(According to the method of H. A. Heise)

The LaMotte Research Department has developed a new, portable, self-contained outfit for the quantitative determination of Alcohol in the blood and urine. The distillation assembly, accurate color standards, standardized reagents and all equipment is mounted in the case itself and is ready to use on a moment's notice. Standard equipment includes thermostatically controlled electric hot-plate for 110-120 volts A.C. current.

This new LaMotte Outfit comes complete, ready to use, with instructions. Price $50.00 F. O. B. Towson.

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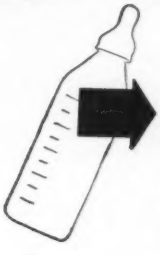

Pretty soft life! Nothing to do but eat, sleep and grow in comfort on S-M-A. It's a happy, healthy first year for the S-M-A fed infant because S-M-A promotes normal, comfortable growth.

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HYPO-ALLERGIC MILK

Hypo-Allergic Milk is thermally processed cows' whole milk in which the sensitizing properties of the protein are altered without affecting the caloric value of the protein or whole milk itself.

It may be used the same as cows' whole milk, as a beverage, or in infant feeding formulae where a sensitivity to milk protein is known to exist.

Complete information upon request.

*S-M-A, a trade mark of S.M.A. Corporation, for its brand of food especially prepared for infant feeding—derived from tuberculin-tested cow's milk, the fat of which is replaced by animal and vegetable fats, including biologically tested cod liver oil; with the addition of milk sugar and potassium chloride; altogether forming an antirachitic food. When diluted according to directions, it is essentially similar to human milk in percentages of protein, fat, carbohydrate and ash, in chemical constants of the fat and physical properties.

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Continued from page 46

headquarters at Bristol, succeeding Dr. James M. Suter, who has been called to military service.

Dr. Paul W. Bowden, who has just completed a postgraduate course at Johns Hopkins, has been appointed Health Officer of Charlotte County, succeeding Dr. W. P. Terry, who has been called to military service.

Dr. E. P. Ambrose, formerly of Christiansburg, is now located in Dublin.

Dr. William R. Hill is now associated with Dr. A. L. Herring for the practice of general surgery, with offices at Grace Hospital, Richmond.

Dr. William Edward Bones, Pulaski, and Miss June Constance Norris were married June 12.

Dr. Charles Russell Robins, Jr., and Miss Susan Clay, both of Richmond, were married recently.

Dr. John Osborne McNeel, University, and Miss Rose Lee Williams, Charlotte, North Carolina, were married June 1.

Dr. William Taliaferro Thompson, Jr., Richmond, now located in Boston, Massachusetts, and Miss Jessie Gresham Baker, Richmond, were married June 21.

Dr. Kenneth Jerome Cherry and Miss Alice Palmer Cottingham, both of Richmond, were married June 14.

DEATHS

Dr. Joseph Nicholas Applewhite, Capron, aged 74, died recently of carcinoma of the stomach.

Increasing Demand for Laboratory Technicians

The ever increasing demand for Gradwohl graduates is the best recommendation for the thoroughness of our course.

Recently we have added two additional months, making the course now one year. In addition, students must serve six months' internship before receiving diplomas. We have added a highly-trained biological chemist to our teaching staff.

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R. B. H. GRADWOHL, M.D.
Director

Dr. Charles White Berry, Charlottesville, aged 70, died recently of aplastic anemia.

Dr. Frederick M. Brooks, Fairfax, aged 82, died June 21.

Dr. Thomas David Jones, Richmond, aged 62, died June 12.

Dr. Charles K. Kernan, Pulaski, aged 79, died recently of arteriosclerosis and pulmonary tuberculosis.

Dr. Roley T. Akers, Alum Ridge, aged 83, died June 16.

Dr. Franklin McCue Hanger, Staunton, aged 79, died June 17.

Dr. Llewellyn Powell, Alexandria, aged 62, died recently.

Dr. David Oswald Foley, Mount Jackson, aged 70, died recently of angina pectoris.

Dr. Percy Edwin Lilly, Kilmarnock, aged 63, died June 15 following a heart attack.

Dr. Otho Perry Campbell, formerly of White Stone, but who was recently in the Army stationed at Camp Blanding, Florida, aged 29, died June 2 of pneumonia.

Dr. Edward O. Woodward, Martinsville, died recently of acute pyelitis and carcinoma of the prostate.

WEST VIRGINIA

Dr. Walter E. Vest, Jr., Huntington, son of Dr. Walter E. Vest, Sr., Huntington, President of the Public Health Council (state board of licensure), was among the applicants for license by reciprocity at the July meeting of that Council. Certificates of licensure are signed both by the President and the Secretary of the Council. It is an unusual incident, and the first instance in West Virginia or the United States so far as is known to the licensing body of that State, in which a father has signed his own son's license to practice medicine. Dr. Walter E. Vest, Sr., is a Past-President of the Southern Medical Association.

Ohio County Medical Society has elected Dr. Carl S. Bickel, President; Dr. Norvell L. Haislip, Vice-President; Dr. Richard D. Gill, Secretary; and Dr. Edward N. Pell, Treasurer, all of Wheeling.

Dr. Robert M. Sonneborn, Wheeling, is on active duty at the Naval Base Hospital in Philadelphia.

Dr. Bert Bradford, Jr., Charleston, and Dr. T. R. Boling, Grantsville, both Army reserve officers, have been stationed since April at Carlisle Barracks, Pennsylvania.

Dr. Wm. Byrd Hunter, Huntington, is in the Army as Medical Director of the School for Medical Department Technicians at Fitzsimmons General Hospital, Denver, Colorado.

Dr. E. O. Gates, Grace Hospital, Welch, has left for Camp Blanding, Florida, 35th Field Artillery.

Dr. Frederick H. Dobbs, formerly of Wheeling, is Medical Officer at Saufley Field, Naval Air Station, Pensacola, Florida.

Dr. Starling D. Steiner, Wellsburg, Health Officer of Brooke County, has been appointed Director of County Health Work in the State Health Department to succeed Dr. Bruce H. Pollock, Charleston, who recently reported for duty with the U. S. Navy.

Dr. Leon A. S. Saler, Charleston, U. S. Public Health Service, has been named Acting Director of the Bureau of Venereal Diseases to replace Dr. Leon A. Dickerson, Fayetteville, who is in active service in the U. S. Army.

Dr. John W. Bolen, Jr., Beckley, and Miss Marie L. Hart, Denver, Colorado, were married recently.

DEATHS

Dr. Benjamin Clifford John, Morgantown, aged 33, died recently of pulmonary abscess.

Dr. Samuel A. McConkey, Barboursville, aged 76, died recently of pneumonia.

Dr. George Andrew Rigrish, Charleston, aged 69, died recently.

Dr. Harry West Rollings, Wardensville, aged 75, died recently of carcinoma of the liver.

Dr. Hosea M. Rymer, Harrisville, aged 71, died recently of angina pectoris.

The need for vitamins and minerals knows no season...
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VI-SYNERAL supplies both . . . Vitamins A, B_1, B_2(G), C, D, E, and other B complex factors, fortified with eight essential minerals—in Funk-Dubin balances.

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SUMMER EPIDEMIC

TINEA OF THE FOOT

relieve with

PMN OINTMENT

fungicidal — bactericidal

PMN Ointment is a 1-1500 concentration of phenyl mercuric nitrate in an oxy-cholesterin, hydrophilic ointment base.

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Levine (J. A. M. A.; 101, 2109) reported 100% cures in 110 cases of tinea of the feet treated with 1-1500 phenyl mercuric nitrate in a hydrophilic, oxy-cholesterin ointment.

SUGGESTED METHOD OF APPLICATION

Cleanse affected parts with soap, water and soft brush; gently rub in PMN Ointment night and morning.

PMN Ointment is available in one-ounce tubes with removable labels, and in one-pound jars.

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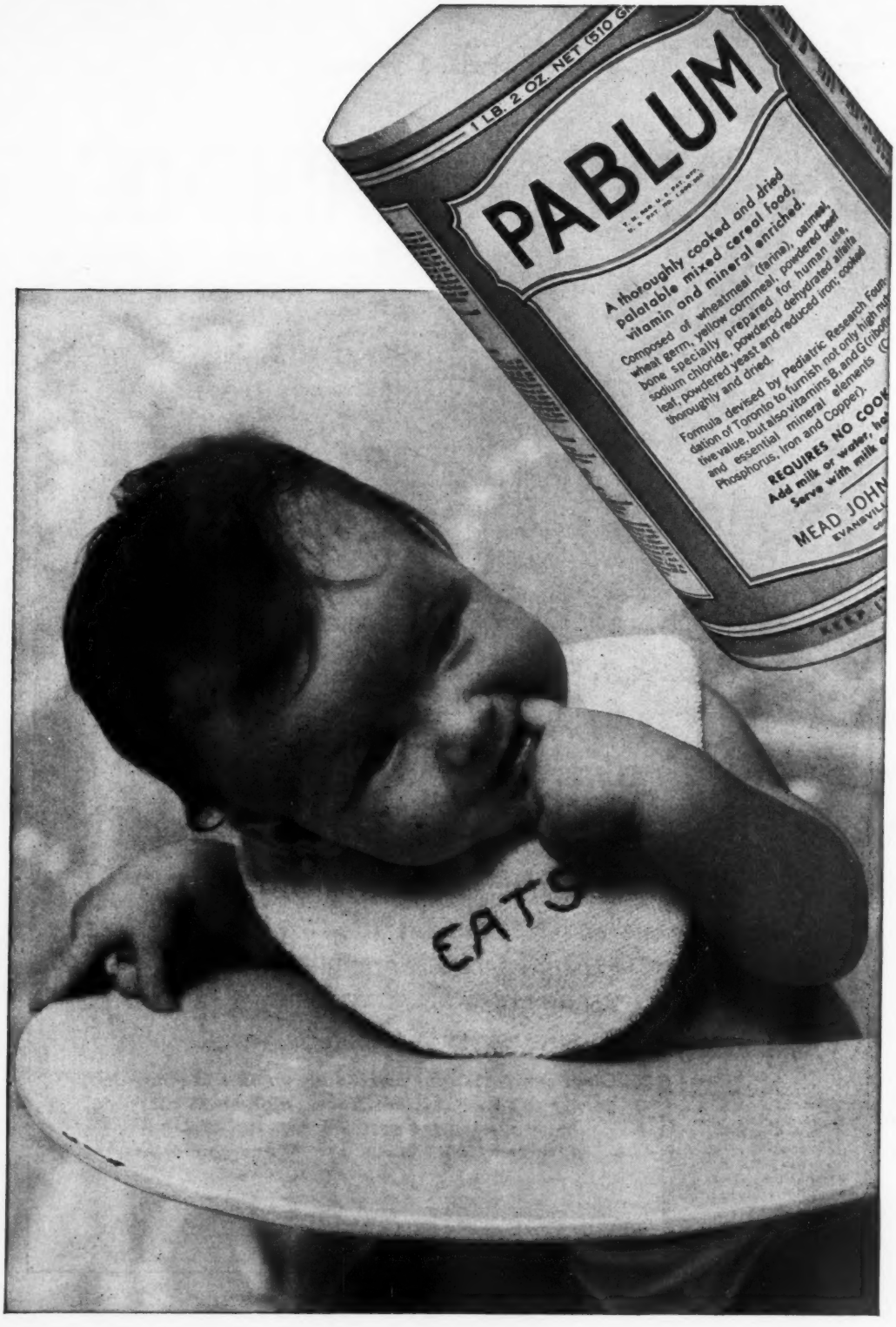
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PABLUM
A thoroughly cooked and dried palatable mixed cereal food, vitamin and mineral enriched.
Composed of wheatmeal (farina), oatmeal, wheat germ, yellow cornmeal, powdered beef bone specially prepared for human use, sodium chloride, powdered dehydrated alfalfa leaf, powdered yeast and reduced iron; cooked thoroughly and dried.
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dation of Toronto to furnish not only high nu
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Add milk or water, he
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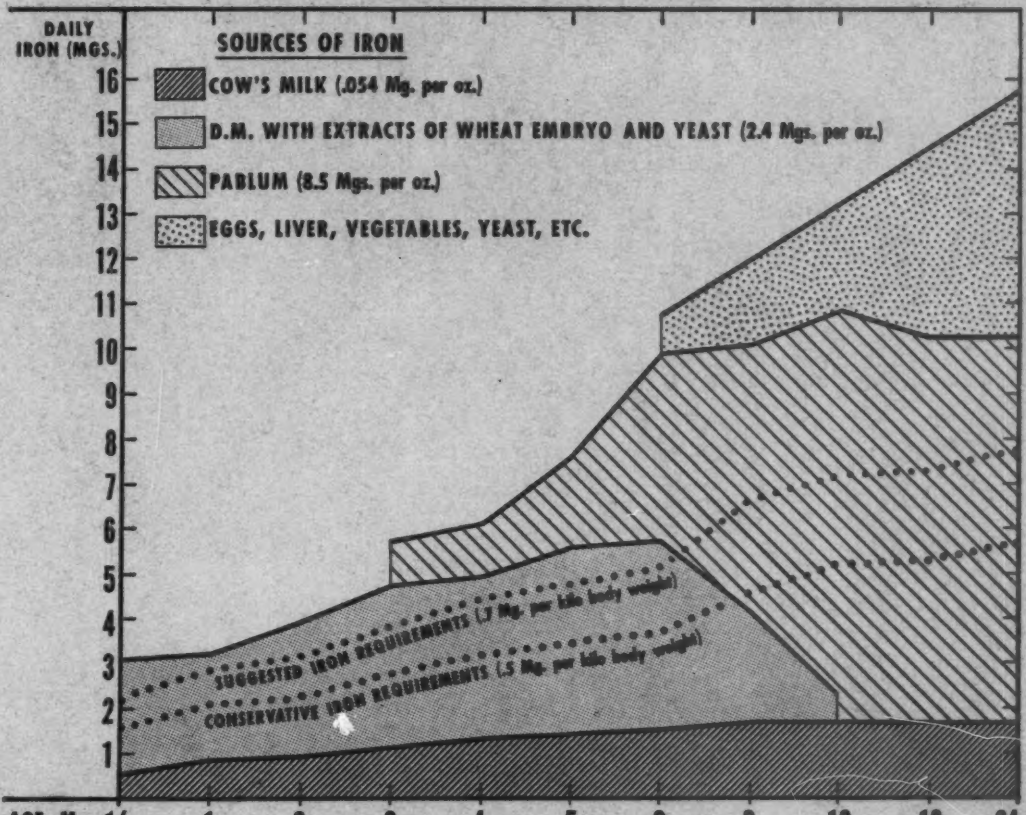
IRON REQUIREMENTS
DURING THE FIRST TWO YEARS



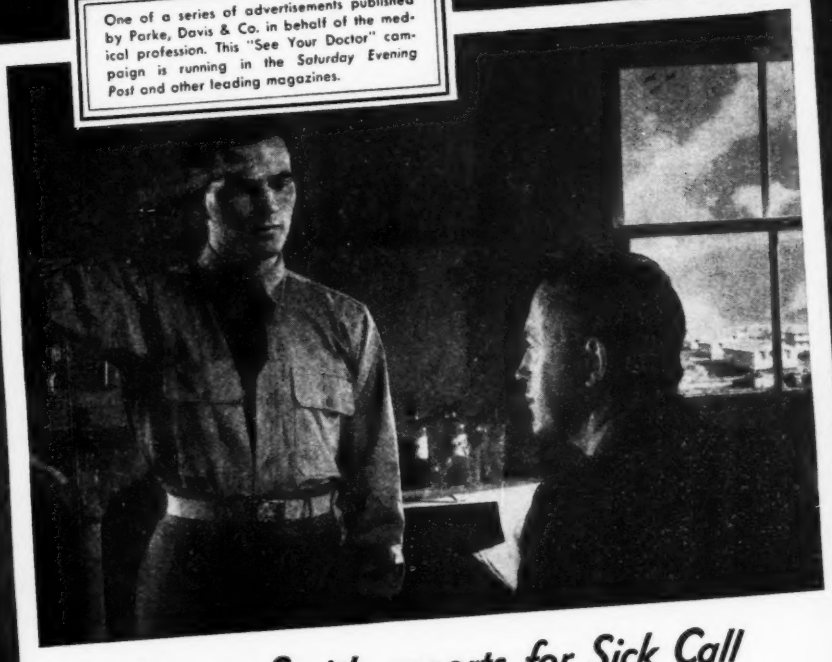
AGE, Mos.	1/4	1	2	3	4	5	6	9	12	18	24
WEIGHT, Lbs.	7	9	10	12	14	15	16	20	22	23	25
MILK, Oz.	10	16	18	21	25	26	28	32	32	32	32
D.M. WITH EXTRACTS OF WHEAT EMBRYO AND YEAST, Oz.	1	1	1¼	1½	1½	1¾	1¾	1	¼	0	0
PABLUM, Oz.	0	0	0	⅛	¼	¼	½	¾	1	1	1

During fetal life the infant accumulates iron in its body. After birth, this supply is rapidly depleted, the hemoglobin frequently dropping to 50% by the third month, especially in prematures. Neither breast milk nor cow's milk is capable of offsetting this loss, as they are deficient in iron. An infant requires one-half milligram of iron per kilogram of body weight. This chart shows that when the carbohydrate and cereal supplements contain iron, a sizeable margin of safety can be maintained, not only during the important first six months, but throughout the first two years of life.

The excess iron thus supplied over iron requirements averages close to 75%, and is needed because some iron is unutilized — a large amount in certain cases. In rapidly growing, or poorly nourished infants, and in the presence of infection, the need for iron may be greater than the chart shows; in some cases, periodic hemoglobin determinations may show the need for iron therapy.

MEAD JOHNSON & COMPANY, Evansville, Ind., U.S.A.

One of a series of advertisements published by Parke, Davis & Co. in behalf of the medical profession. This "See Your Doctor" campaign is running in the *Saturday Evening Post* and other leading magazines.



Private Smith reports for Sick Call

PRIVATE TOM SMITH is feeling a little under the weather.

If he were back in civilian life, the chances are he'd say, "I'll be all right in a little while," and he'd show up for work as usual.

But in this man's Army of ours, a soldier who feels below par is required to report for "Sick Call," even if he thinks there's nothing much wrong. Private Tom Smith is simply obeying orders.

Because of this wise institution known as "Sick Call," our Army doctors have an opportunity to combat illnesses at the very start and are usually able to prevent them from edging over into the danger zone. This is one of the reasons why the standard of health in our Army of 1941 sets an all-time high.

In this there is a valuable lesson for many a civilian . . .

We're thinking now of the man who permits himself . . . and his family . . . to run risks which no soldier is allowed to take. We're thinking of the man who says, "If I don't feel better tomorrow, I'll see the doctor." But will he? And when he does, will it be too late? Too late to prevent a serious illness, or too late to gain the advantage of time in treating a disease already contracted.

So why not establish the "Sick Call" system in your household? Stomach ache, you know, is sometimes the first warning of appendicitis; a sore throat may be the forerunner of a condition which requires expert attention. When you, or any of your family, develop even a seemingly minor ailment, don't waste time which may be precious.

Call your doctor, and let *him* decide whether or not the ailment is trivial—and what should be done about it. He knows—you don't. Report for "Sick Call" promptly

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